April 12, 1948

STEEL

APR 1

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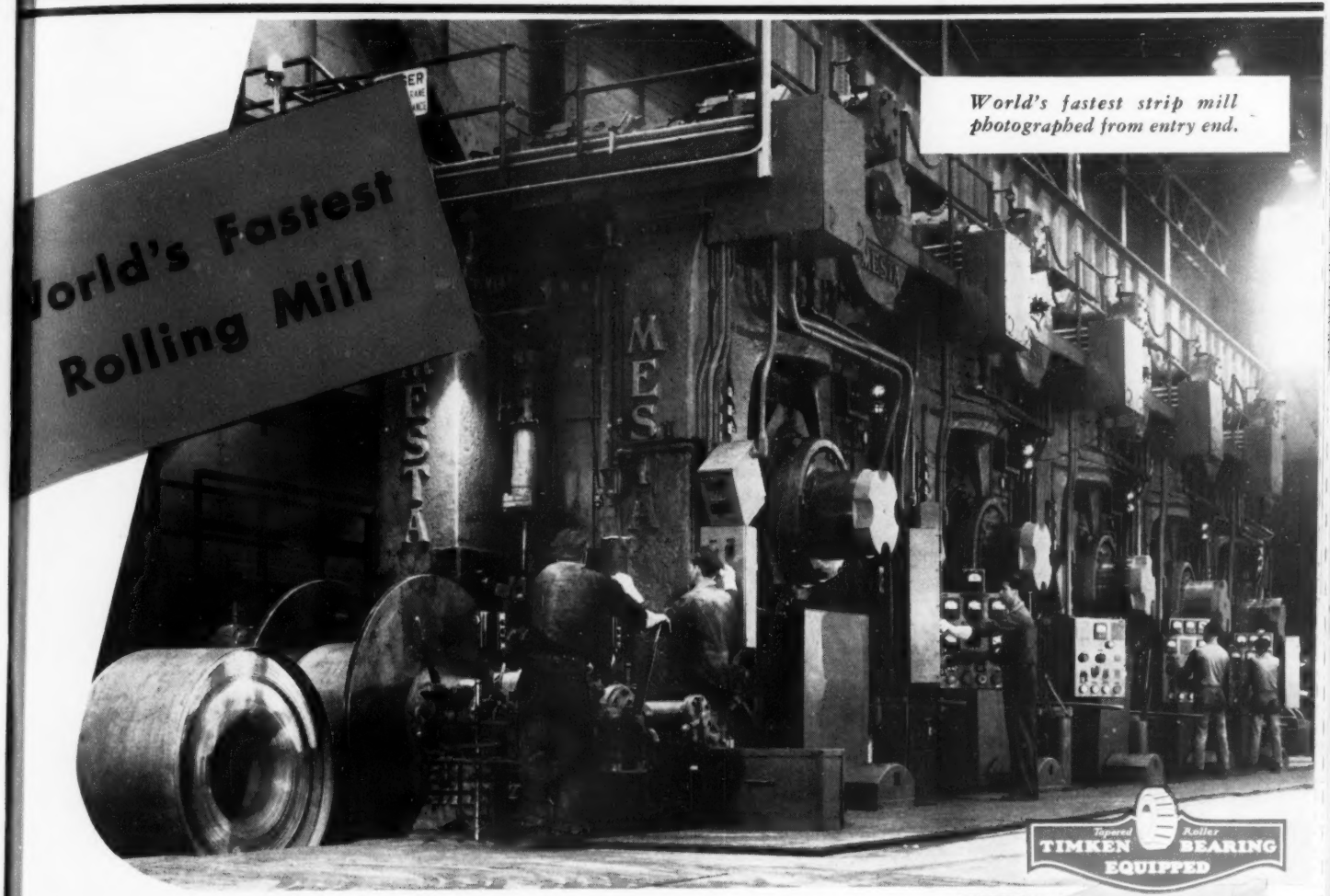

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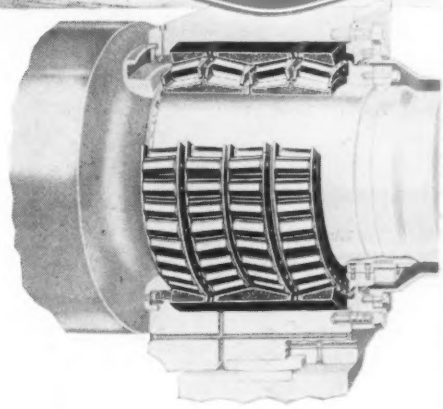

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Business Staff on Page 4

NEXT WEEK . . .

Controlled Galvanizing Produces Uniform Tank Coatings

Reducing Costs with Pneumatic Chip Conveyors

Pipe Forming After Welding

Overhead Carrier System Streamlines Material Flow

STEEL

The Magazine of Metalworking and Metalproducing

VOL. 122, NO. 15 APRIL 12, 1948

NEWS

★ As the Editor Views the News 47
★ News Summary 51
Coal Strike Losses Mount 53
Hits at Monopolistic Strikes 54
★ Present, Past and Pending 55
Acute Metal Shortage Pends 56
Procurement Machinery Oiled 58
Mammoth AFA Meeting To Be Held May 3-7 59
"Must" Controls Seen Inevitable 59
★ Windows of Washington 60
Pacts Promote French Recovery 63
Bank Loans To Aid German Firms 63
★ Facts for Industry 64
Oil Field Steel Needs Pressing 65
Steel Pinch Tightens on Coast 65
★ Mirrors of Motordom 67
Republic 1947 Expansion Set at $33 Million 70
★ Briefs 71
★ The Business Trend 72
★ Men of Industry 74
★ Obituaries 77
★ Construction and Enterprise 162

TECHNICAL

★ Engineering News at a Glance 81
Arc Welding Stainless Impellers 82
★ Seen and Heard in the Machinery Field 85
Strain Gage Technique Employed in Studying Tank Stresses 86
Automatic Broaching Pushes Work Through Tool 89
Integrated Cleaning and Rust Proofing 90
★ Progress in Steelmaking—New Tin Plate Developments 94
Buffalo Host to American Society of Lubrication Engineers 98
Larger Carbon Blocks Reduce Furnace Lining Cost 101
★ Letters to the Editors 102
British Annealing Furnace Heat Treats 45-Ton Plates 104
45-Second Spectrochemical Analysis of Metals 109
Power Brush Uses Increased in Light Metal Finishing 114
Roll Life Increased 35% by Controlled Airless Blasting 116
Industrial Power Consumption Expected To Rise 118
★ New Products and Equipment 123
★ Helpful Literature 135

MARKETS

★ Market Summary 137
★ Market Prices and Composites 138

★ *Index to Advertisers* 168

★—Denotes regular features.

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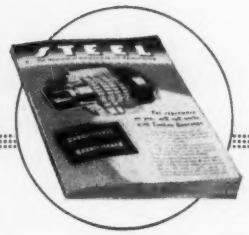


April 12, 1948

More for the Many

Unless unforeseen circumstances postpone the event, the 100 millionth automobile produced by the American automotive industry will roll off of one of the nation's assembly lines in the late summer or early fall of this year.

This will be an important milestone in one of the most significant developments in the world's history. It is almost impossible to overestimate the extent of the impact of the American motor car, not only upon the methods of production and manufacture but also upon the social and economic development of a substantial portion of the civilized population of the world.

Although it is possible to trace these influences of the American automobile to remote corners of the globe, its most significant reflection is found in a condition that as yet is almost exclusively distinctive to the United States and Canada. We refer to the fact that in these countries millions of persons in widely divergent walks of life find it possible to own and operate their own cars. Visitors to our shores from Europe, Asia and Africa invariably are amazed at the sight of workers' private automobiles in employees' parking lots adjoining large industrial plants. This is a spectacle unknown in any important degree anywhere else in the world.

The system of mass production and mass consumption, which was evolved during the half-century development of the automobile, now is an established American institution. Intelligent application of some of its features helped us to achieve production miracles in World War II. Adaptation of some of its techniques to postwar production problems is helping us to make dozens of mass produced articles available to new millions of mass consumers. We can be fairly confident that our distinctive system of producing more for the many still is capable of improvement and refinement and of broader application.

At the same time, we should realize that our precious system is not foolproof. Neglected or abused, it can become a Frankenstein that could easily wreck our economy. Long before motordom is well advanced on the production of her second 100 million cars, we as a nation must know more than we know now about controlling mass production and mass consumption—if we are to preserve the system.

* * *

HE'S ASKING FOR IT: One would think that a man as smart as John L. Lewis would realize that the more arrogant and unreasonable he is in placing the welfare of his miners ahead of the interests of the public and of the nation at large, the more certain it is that legislation will be enacted to curb his powers. Congressman Fred A. Hartley Jr. was not far wrong when, referring to Mr. Lewis, he told the House that "this cantankerous gentleman is trying to prove that the Taft-Hartley law is too drastic. On the contrary, he is proving that it is not drastic enough."

At any rate, bills will continue to be proposed until one is adopted that will really stop monopolistic strikes which paralyze the nation's economy. It is doubtful whether the Taft-Hartley act will prove effective in this respect. Meanwhile, Representative Hartley has introduced another bill, H. R. 6074, which he believes may curb the power of arbitrary labor leaders such as Mr. Lewis.

This bill defines monopolistic strikes, declares such monopolistic strikes to be unlawful concerted activities and amends the Clayton Act so as to permit the Department of Justice to prose-

(OVER)

cute instigators of monopolistic strikes under the Sherman antitrust law.

Mr. Lewis would be the first to call this legislation "too drastic," yet his unreasonable actions have been inviting it for at least six years.

—pp. 53, 55

* * *

NONFERROUS DEMAND UP: Consumers of nonferrous metals are more concerned about the adequacy of supplies than at any time since V-J Day. At present, the markets are delicately balanced and it would not take much to tilt them toward acute shortages or toward a balanced supply-demand situation.

Right now the chances are in favor of the former. This is because the initial effect of the government's expanded preparedness program will be felt in airplane construction and accelerated stock piling. Consumers believe both of these activities will siphon off substantial tonnages of nonferrous metals from commercial channels.

The aluminum industry, confronted by an amazingly heavy postwar demand, has been handicapped by power shortages. The domestic lead situation has been aggravated by labor trouble in Mexico. Tin supply still is affected by unsettled conditions in the Far East. Likewise supplies of magnesium, copper and zinc are subject to adverse factors in varying degree. It will be nip and tuck in nonferrous metals.

—p. 56

* * *

NO PROCUREMENT RUSH: As part of the present much publicized preparedness program, the government is reorganizing its machinery for procurement of materiel. The Munitions Board is surveying 11,000 industrial plants to determine what, how much and how soon they can produce the equipment and supplies the government will need for its expanded program. Later the survey will be broadened to cover 22,000-25,000 of the total number of 86,000 industrial establishments in the nation. The 22,000-25,000 plants account for about 90 per cent of the country's productive capacity.

Meanwhile, actual orders for military equipment issued in the near future will be confined largely to aircraft, to the acceleration of certain defense projects already started and to the construction of fast tankers and troop transports. The appropriation for other types of armament amounts to only $500 million.

From the foregoing it is apparent that the expanded preparedness program does not necessarily presage an early or widespread rush of orders. Aside from early activity in aircraft, the immediate program is largely exploratory.

—p. 58

* * *

COSTLY REPARATIONS: Since February, 1946, workmen have been dismantling the Krupp Essen-Borbeck steelworks for shipment to the USSR for reparations. Perhaps two more years will pass before the job is completed. Then, according to Russian estimates, the facilities constructed in Russia from the transplanted equipment will have a capacity of only 10 to 20 per cent of that of the original German plant.

If the Russians can salvage only 10 to 20 per cent capacity from this relatively accessible steelworks, what will be their percentage of recovery on the hundreds of millions of dollars worth of electrical and mechanical equipment that the Soviets removed from scattered points throughout Manchuria? The chances are that in numerous instances, the removed equipment will be found to be incapable of operation in its new location. The Russians will have gained a tonnage of scrap, but at a fantastic price.

—p. 63

* * *

7.2 HP PER EMPLOYEE: Speaking at the Midwest Power Conference in Chicago last week, F. R. Benedict of Westinghouse Electric Corp., declared that power consumption per industrial worker has increased 120 per cent during the past 20 years. Today each worker on the average has at his disposal 7.2 horsepower, 93 per cent of which is electric power.

These figures are impressive. An important factor in the high productivity of American workers compared with that of their contemporaries in other countries is the assistance they received from mechanical aids and power. Now there are convincing indications that the amount of power consumed per employee may increase even more rapidly in the future than in the past. Many firmly established production and manufacturing operations in industry constantly are requiring more horsepower to keep pace with increased output. Also, some of the most promising new metallurgical and manufacturing processes on industry's ever-changing horizon will be heavy consumers of kilowatts. —p. 118

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

COAL CRISIS—Blast furnaces, open hearths, coke ovens, foundries and finishing mills were being taken out of production on a large scale at the end of last week, the fourth of the coal mine walkout. The steel industry had gambled that an early settlement of the dispute would be reached and had held operations as near capacity as possible for the first three weeks of the strike. Now they are reaching the bottom of the coal stockpiles and an abrupt decline in operations has started. Losses to date (p. 53) are staggering: 44 million tons of coal; 500,000 tons of steel; $117 million in miners' wages; losses of employment to thousands in the steel, railroad and other industries. Metalworking companies soon will feel the impact of the coal strike in decreased receipts of finished steel.

PREPAREDNESS—While the coal strike places a brake on this country's military preparation and foreign aid programs, Uncle Sam is continuing to oil his bear guns (p. 58). Machinery for the procurement of materiel is being organized and the Munitions Board is proceeding with a survey of the major industrial establishments to determine what, how much and how soon they can produce. Brass hats of the three armed services are poring over the new procurement law which becomes effective next month in an attempt to draft uniform procurement policies. Reports that the government is considering building new steel capacity at tidewater points are heard in Washington.

METALS SCARCE—In the face of the preparedness program, this country is facing the most acute shortage of nonferrous metals in its peacetime history. Should military procurement be stepped up substantially, scarcities of lead, copper, aluminum and other metals will be increasingly troublesome (p. 56).

TAXES—The income tax reduction recently voted by Congress is likely to be the last relief the country will receive for some time. Although congressmen still talk of the possibility of revising excise and business taxes, increasing expenditures for foreign aid and rearmament (p. 60) make such a move unlikely.

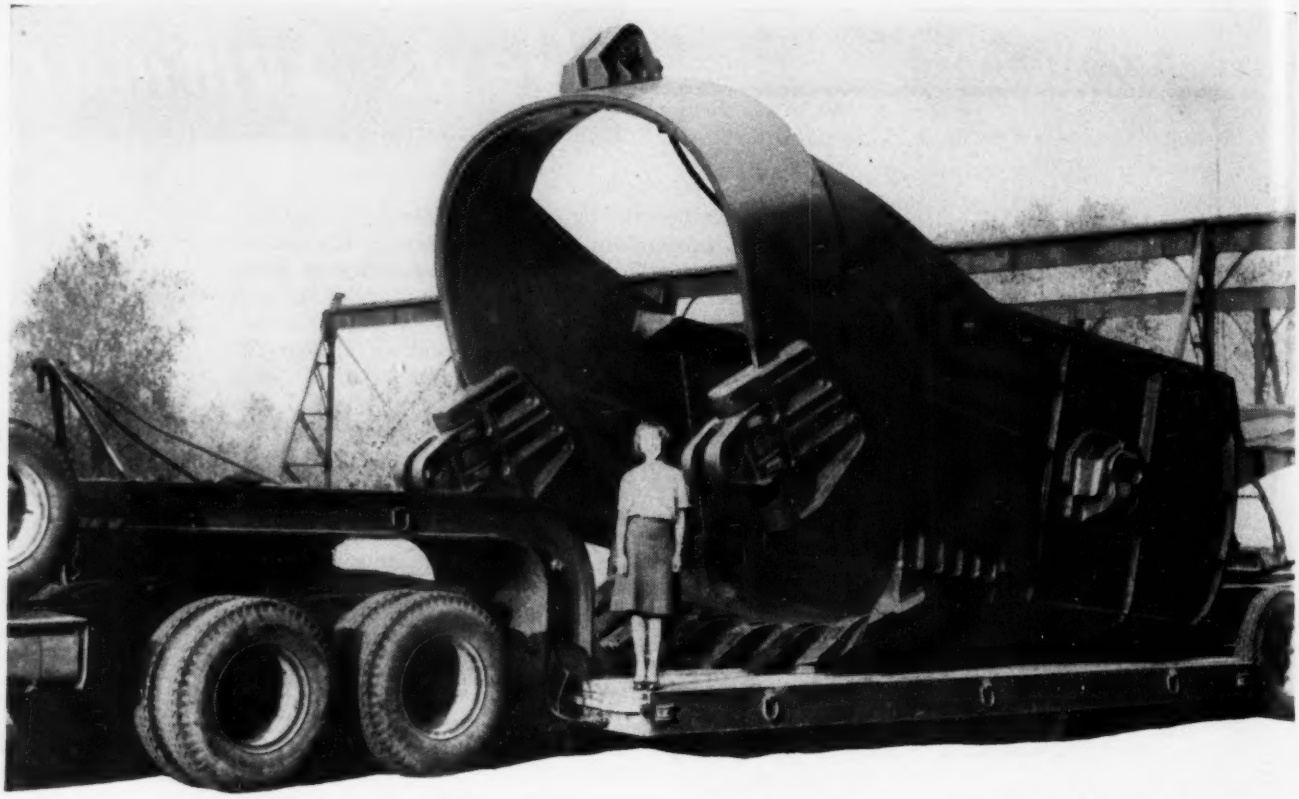
HUNDRED MILLION CARS—Late this summer the 100 millionth car to be produced by the United States automotive industry in slightly more than a half century will roll off the assembly lines (p. 67) and Motordom is anticipating celebration of the event. Just which auto will be No. 100,000,000 will be a guess as early production records are not exact. The occasion may bring a revival of the national automobile show at a new location—Detroit.

FOREIGN—France will receive coal from Poland in return for automobiles, trucks and electrical equipment under terms of a five-year trade agreement (p. 63) just negotiated. France also has signed trade pacts with Italy and Switzerland, lending hope that European economic relations are progressing. In Germany, large loans have been made to metalworking companies to finance reconstruction and to provide working capital.

GERMAN COMPETITION—American machinery makers are disturbed over competition on the continent from German manufacturers operating in the British zone. They raise the question: Is the United States underwriting this competition from a defeated enemy through grants to Britain and Germany?

OIL FIELD NEEDS—Total steel requirements of the petroleum industry for the next 18 months are estimated at 15½ million tons by the oil representatives (p. 65) in connection with the voluntary allocations program. The petroleum men say exhausted steel inventories are limiting production in the face of expanding demand.

SIGNS OF THE TIMES—Hearings in the Federal Trade Commission's case against the steel industry (p. 60) will be resumed Apr. 13. . . . Republic Steel expenditures for expansion in 1947 totaled $33 million (p. 70). . . . Screw machine product manufacturers (p. 59) studied methods to improve their status at a Chicago convention. . . . Steel wage negotiations opened in Pittsburgh last week (p. 55), but were adjourned without action or announcement of the union's demands.



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Presidential advisers arrive at White House to counsel the Chief Executive on what to do about John L. Lewis. Left to right: Secretary of Labor Lewis B. Schwellenbach, Attorney General Tom Clark and Cyrus Ching, mediation director. NEA photo

STEEL
April
12
1948

Coal Strike Losses Mount

LOSS in bituminous coal production in the past four weeks of the mine idleness is estimated at 44 million tons, within 5 million tons of the total stocks held by industry and dealers at the beginning of March.

Drastic reductions in steelmaking operations were started by mills last week as coal stockpiles neared depletion. Ingot operations dropped to 78 per cent of capacity, off 10½ points from the preceding week. Most of the reductions occurred in the middle or latter part of the week, bringing operations at week's end to a lower level than indicated by the average. The coal mine walkout was entering the critical stage.

Loss in steel production to the end of the week is placed at 514,000 tons. Further substantial losses are inevitable, regardless of how soon the miners return to the pits. From a week to ten days will be required to place the idle steelmaking facilities back in operation.

Wage Loss High—The bituminous coal miners have lost more than $115 million in wages during the past four weeks—over a dispute involving a welfare fund of $32 million. Miners recently have been averaging $71-$72 a week. Anthracite miners began to join in the walkout last week to swell the loss in wages, man-hours and production.

BOX SCORE

Coal Output Lost (Tons)	44,000,000
Steel Output Lost (Tons)	514,000
Wages Lost—By Miners	$117,200,000
Man-Hours Lost By Miners	63,300,000
Bituminous Workers Idle	400,000
Anthracite Workers Idle	40,000
Steelworkers Idle	16,000
Railroad Workers Idle	60,000

Man-hours lost by the miners exceed 63 million, the greatest loss due to an industrial work stoppage since the strike epidemic in the spring of 1946 (see chart, on page 54). About 400,000 bituminous miners were idle.

Steel, Railroad Workers Affected—Curtailments in operations by the steel mills and the railroads caused many thousands of workers in these industries to be idled. Layoffs were being made by so many companies late last week that an accurate count was difficult.

At least 60,000 railroad workers were furloughed. The Chesapeake & Ohio was forced to lay off about 14,000, the Pennsylvania 10,000, the Baltimore & Ohio 7000.

Steel mills cut back employment as facilities began to be taken out of production on a large scale. Some displaced workers were put on maintenance jobs. Staggering of work schedules provided part-time employment for others. At week's end a check by STEEL indicated that the equivalent of 16,000 employees had been idled by the coal shortage, although the total number of steelworkers affected was greater.

Effect on Consumers Delayed — Impact of the coal strike and the

consequent loss of steel production has not yet been felt to any great extent by metalworking companies. Most of these companies are maintaining their recent normal operations, drawing on slender steel inventories and the almost normal steel shipments from mills and warehouses. Many metalworking companies will begin to feel the pinch in finished steel this week. Some mills started to cut shipments to consumers during the past four days.

Metalworking executives making civilian products expect they will bear the brunt of the loss in steel production. Requirements for the expanding military preparedness program and for the European Recovery Program will come first and the domestic economy will get what is left.

Effect of the coal strike will be to prolong the shortage of steel that has plagued consumer goods industries since the war, a shortage that in large measure has been caused by the 1946 steel strike and six periods of idleness in the coal mines.

Ships Go Light—Lake freighters are going up the lakes without coal cargoes. Bunker coal is scarce and

(Please turn to Page 157)

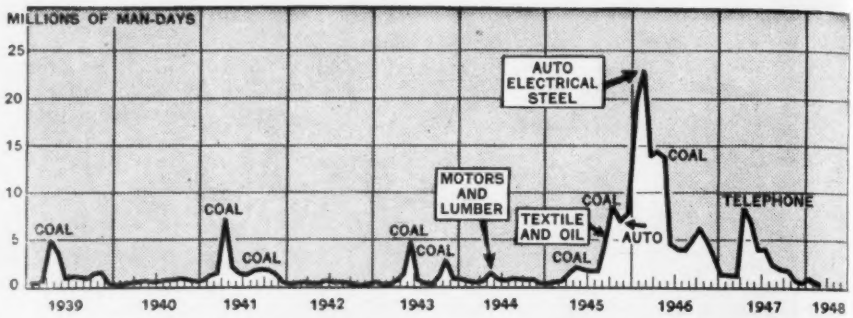
GRAY MARKET WEAK

CLEVELAND

Offers of strip-mined coal at gray market prices are finding few takers among industrial users in this area. As during previous coal mining stoppages, fuel from nonunion mines, usually strip operations, is being offered to consumers who ordinarily buy coal from the closed mines. Some sales are being made, usually for steam purposes.

Most industries, however, find the quality of coal offered is not suitable for their requirements. Strip coal from the so-called "wagon" mines, often is of inferior quality.

One of the larger interests in the strip-mining picture, however, has developed its coal preparation methods to a point where its product is interchangeable in use with pit-mined coal. On the strength of the frequent unavailability of Pennsylvania and West Virginia coal, due to mine idleness, this interest has persuaded utility companies and other large users to take long-term contracts for prepared strip coal.



Time lost by strikes was proceeding at a postwar low until the coal miners walked out last month. Note how frequently coal strikes have caused lost time since 1939

Hits at Monopolistic Strikes

WASHINGTON

BILL AIMED at preventing the paralyzing of the nation's economy by monopolistic strikes has been introduced by Representative Fred A. Hartley Jr. (R., N. J.) who is chairman of the House Education & Labor Committee and co-author of the Taft-Hartley law.

In H.R. 6074 Representative Hartley believes is to be found the answer as to how to curb the power of John L. Lewis and other arbitrary labor leaders.

This bill has these three provisions: 1—It has a definition for monopolistic strikes; 2—it declares such monopolistic strikes to be unlawful concerted activities; 3—it amends the Clayton Act so as to permit the Department of Justice to prosecute instigators of monopolistic strikes under the Sherman antitrust law.

Congressman Hartley expects the House to approve the bill. He points out that its language was approved in the House by a 3 to 1 majority last year but was deleted in conference in deference to Senate arguments that inclusion of such a section might prevent enough Senate votes to override the expected veto of the Taft-Hartley bill.

Not Drastic Enough—Referring to Mr. Lewis, Congressman Hartley told the House: "This cantankerous gentleman is trying to prove that the Taft-Hartley law is too drastic. On the contrary, he is proving that it is not drastic enough."

Representative Hartley believes that while the Taft-Hartley Act represents a great step forward in preventing abuses in labor-management relations it continues in need of further improvements which were advocated by his committee last year.

In addition to the ban on monopolistic strikes which he now again is proposing, he told STEEL that at least two other amendments are urgently needed. He would make it a federal offense for a union to interfere with a man's right to work through coercion or intimidation of the man or his family. And he recommends a law defining permissable picketing and outlawing the use of pickets who are not bona fide employees of the struck establishment, as the use of seafarers as pickets in the New York Security Exchange strike.

It takes time to get such bills through the House, and particularly the Senate, so that there is no present assurance that these two additional proposals will be enacted at this session; Mr. Hartley believes, however, that the need for them is such as to assure their eventual adoption. His Education & Labor Committee expects to report a bill outlawing interference with a man's right to work in plenty of time for action by both houses before the summer recesses. Cecil B. DeMille, Hollywood motion picture producer who was thrown off the air as a result of union dictation, is one of the chief witnesses.

Featherbedding—Whether the country also needs a further ban on featherbedding and make-work practices Mr. Hartley is not so sure. The need would have to be shown as much more urgent than now appears, and a thorough investigation would have to be made. The Taft-Hartley Act ban on the exaction of pay for work not performed, said Mr. Hartley, effectively stopped Petrillo's practice of forcing the radio broadcasting stations to pay unwanted musicians—and that marks a distinct improvement over the former condition.

Incidentally, staffs of a number of investigating committees seem to have uncovered little evidence of late that featherbedding practices are widely prevalent and add appreciably to the cost of living at this time. The extensive 198-page report of the

Joint (Watchdog) Committee on Labor-Management Relations passes over this subject entirely. Inquiry by STEEL revealed that the original draft of the report contained a few paragraphs about featherbedding, but these were deleted by the committee prior to sending to the printer for the reason that there was nothing significant in them.

Again, the monumental report of the Joint Committee on Housing, in pointing out that housing costs must be reduced, put the finger on "private enterprise" and made no mention of swelling of costs due to make-work practices.

Steel Wage Parleys Get Under Way

Steel wage negotiations got under way last week between the United Steelworkers of America and several of the nation's leading steel producers, but at the end of the week word was lacking as to what progress toward resolving the issue had been made. Existing contracts with the steel companies have another year to run though either side could reopen the wage question as of Apr. 1, 1948.

Negotiations between six subsidiaries of U. S. Steel Corp. and the union opened last Monday but adjourned on Tuesday until this week. Sessions were behind closed doors and no hint was given as to what specific wage demands the union has in mind. In addition to the subject of wages, an insurance program may be discussed.

Union meetings with some other basic steel producers, such as Bethlehem Steel Co. and Republic Steel Corp., also started last week. Expectations are that negotiations in the case of these companies will proceed slowly with final agreements likely to be held off until a wage pattern is established by U. S. Steel subsidiaries. Some companies have later contract reopening dates, and still others requested an extension of contract reopening negotiation periods.

United Steelworkers Local 1196, District 19, feted the supervisory force of Allegheny Ludlum Steel Corp.'s Brackenridge, Pa., plant, Wednesday evening, Apr. 7, at the Brackenridge Heights Country Club. Similar get-togethers have been held in the past but formerly were restricted to plant superintendents and shop stewards. This is said to be the first time in union-management relations that the union department chairman representatives have been present at such an event. Philip Murray and other top union officials were present, as well as H. G. Batcheller, president of Allegheny Ludlum, with key company production and labor relations personnel.

Gearmotor of Compact Design Shown Editors

Joint production of a gearmotor of compact design and possessing important industrial applications was announced by Reliance Electric & Engineering Co., Cleveland, and Philadelphia Gear Works Inc., Philadelphia, Apr. 6. Gearmotor operations were demonstrated to business paper editors during a tour of the Reliance company's plants in Ashtabula, O., and Cleveland.

Gearmotor will be built in six basic sizes or diameters capable of delivering from 1 to 60 hp. They will operate on either alternating or direct current in a speed range from 7½ to 780 revolutions per minute. Single, double or triple reduction units can be used with each size of motor. Simplification in design reduces number of gears required from 324 for previous designs to 42 and means that one set of gears will serve a number of motors.

During the plant tour announcements were made concerning a new chemical motor for operation in explosive, acidic or abrasive atmospheres and a special motor for the new continuous miner developed by Joy Mfg. Co., Pittsburgh. Laboratory experiments in electronic controls for rapid and accurate adjustments of motor speed were also demonstrated.

Allegheny Installing Hot-Topping Units

Allegheny Ludlum Steel Corp., Pittsburgh, is installing electric hot-topping units developed by the M. W. Kellogg Co., Jersey City, N. J., which virtually eliminate the pipe in steel ingots which must be cropped off. At Watervliet, power is supplied by a battery of motor-generator sets —one for each mold—built by the Lincoln Electric Co., Cleveland. International Nickel Co. has been using a somewhat similar method at Huntington, W. Va., for some time (STEEL March 12, 1945, p. 106).

Present, Past and Pending

■ NAMED VICE PRESIDENT OF NATIONAL TUBE CO.
PITTSBURGH—Edmund G. Price has been named vice president, operations, National Tube Co., succeeding E. N. Sanders who becomes assistant to the vice president, engineering and operations, U. S. Steel Corp. of Delaware.

■ PURCHASE OF SURPLUS PLANT DELAYED
CINCINNATI—Electric Auto-Lite Co., Toledo, which was to purchase a major part of the former Wright Aeronautical Corp. plant at Lockland, O., has agreed to a 45-day delay requested by the U. S. Air Force in view of the international situation.

■ PURCHASES DAINGERFIELD, TEX., BLAST FURNACE
DALLAS, TEX.—Lone Star Steel Co. has purchased the 1200-ton government-built blast furnace at Daingerfield, Tex., which it has been operating since last year. Company paid $1½ million down on purchase price of $7½ million.

■ BABCOCK & WILCOX ELEVATES OFFICERS
NEW YORK—A. G. Pratt, president, Babcock & Wilcox Co., was to be elevated last week to chairmanship, and Alfred Iddles, vice president, was to be elected president and chief executive officer.

■ BETHLEHEM TO BUILD FOUR SUPER-TANKERS
WILMINGTON, DEL.—Bethlehem Steel Co. is to build four super-tankers for the Texas Co. They will be 595 feet long, have an 84-foot beam.

■ GE TO DEVELOP PARTS FOR JET HELICOPTERS
SCHENECTADY, N. Y.—New facilities for development of component parts for proposed U. S. Air Force jet-propelled helicopters have been established at General Electric Co.'s Flight Test Center near here.

■ PART OF STEEL FOUNDERS' CAPACITY IDLE
CLEVELAND—Operations in the steel castings industry are at only 60 per cent of capacity, the Steel Founders Society of America told the Office of Industry Co-operation last week.

■ SECRETARY OF STEEL WAREHOUSE COMPANY DIES
PHILADELPHIA—Joseph A. Wayne, 65, general purchasing agent and secretary of the board, Morris Wheeler & Co. Inc., steel distributor, died Apr. 5 at his home, Havertown, Pa.

REFINED COPPER STATISTICS

(Net tons, as reported by Copper Institute Inc.)

	Production	Deliveries	Stocks
1948			
Feb.	93,588	106,823‡	70,146
Jan.	102,314	118,855	71,533
1947	1,196,393	1,383,661†	76,305
1946	604,071	1,261,830*	80,832
1945	843,113	1,517,842	76,512
1944	1,098,788	1,636,295	66,789
1943	1,206,871	1,643,677	52,121
1942	1,135,708	1,635,236	65,309
1941	1,065,667	1,545,848	75,564
1940	1,033,710	1,001,886	142,772
1939	818,289	814,407	159,485
1938	638,076	481,303	289,755

* Includes 909 tons exported. † Exclusive of 3609 tons exported. ‡ Exclusive of 672 tons exported.

TIN

(Office of Materials Distribution)

Stocks	Jan. 1		
Government	1946	1947	1948
Concentrates	32,536	24,642	18,282
Pig*	23,350	17,197	24,555
Industrial			
Pig	14,951	14,837	14,438
Other	8,646	9,109	9,112
Total	79,483	65,785	67,387

* Does not include Munitions Board stocks.

Supplies	1946	1947
Imports, Concentrates	38,116	30,503
Imports, Pig Tin	6,716	33,692
Secondary (Domestic)		
Pig Tin	2,512	3,160
Alloys	22,025	23,322
Total	69,369	90,677
Consumption and Exports	80,386	87,598

U. S. SLAB ZINC STATISTICS

(Net tons)

	Production	Shipments	Unfilled Orders	Stocks At End
1948				
Feb.	66,784	68,396	72,224	53,473
Jan.	71,505	84,431††	67,562	55,085
1947	848,027	955,816*	59,705	68,011
1946	759,346	842,937‡	58,057	175,800
1945	799,520	777,649**	27,092	259,391
1944	901,332	837,322	21,332	237,520
1943	971,873	887,638	44,914	173,510
1942	929,770	885,568	52,752	68,268
1941	863,955	857,471	87,666	24,066
1940	706,100	762,780	125,132	17,582
1939	538,198	598,972	53,751	65,995
1938	456,990	395,554	40,829	126,769

Including on government account: * 140,230 tons; ‡ 62,007 tons; ** 5302 tons; †† 10,156 tons.

Acute Metal Shortage Pends

Nonferrous metals users may be forced into heavier competition for supplies because of ERP and security programs. Aluminum is particularly affected

METALWORKING companies are confronted with the most stringent supply situation ever encountered in peacetime so far as nonferrous metals are concerned.

Users of metals have been unable to obtain sufficient tonnages to cover their needs fully and now must compete for available supplies with buyers operating under several government-sponsored programs. They are especially concerned with the implications of the national security program which may siphon off substantial tonnages of metals from commercial channels. If this program assumes the size now envisioned by its proponents, the airplane industry will be the first to feel its effects and will require substantially more aluminum.

Furthermore, any preparedness program undoubtedly will involve a step-up in the government's stockpiling program which has been slowed down in deference to industry's needs. Recent international developments may cause government officials to decide they can no longer delay the accumulation of strategic materials.

Stockpiling — The size of the government's permanent stockpile has never been divulged, but it is common knowledge that its copper, lead and zinc requirements reach a huge total. Copper and lead supplies in the stockpile are still low, but those of zinc are fairly large, substantial tonnages having been transferred during the last six months from Office of Metals Reserve holdings.

President Truman asked Congress last week for an additional $375 million to be made available for the stockpiling of strategic and critical materials. The additional funds would be in the form of a contract authorization to the Treasury Department. The proposal was made in addition to an estimate of $3 billion for an increase in our national security program.

The Army and Navy Munitions Board originally asked for $660 million for stockpiling in fiscal 1949, but this amount was cut to $360 million by the Bureau of the Budget. The amount now proposed by this Bureau would make available the original request plus $75 million.

With the request of the President, the House Public Lands Subcommittee on Mines and Mining revealed estimates submitted by the Army & Navy Munitions Board of proposed acquisitions of metals and minerals for the stockpile in fiscal 1949. Of the $360 million estimated for 1949 procurement in the original request, $285 million is for new acquisitions, including $202,102,335 for metals and minerals.

U. S. REFINED LEAD STATISTICS

	Production	Domestic Shipments	Stocks At End
1948			
Feb.	43,598	47,200	17,034
Jan.	50,821	51,958	20,645
1947	583,716	608,421	21,787
1946	413,903	411,433	48,088
1945	525,328	500,003	43,476
1944	538,618	552,063	19,536
1943	546,673	548,417	33,090
1942	633,818	618,947	34,937
1941	634,888	655,542	20,185
1940	585,480	603,143	40,926
1939	497,991	555,074	58,777
1938	408,539	431,625	115,902

The subcommittee also revealed that the estimate of the current value of overall stockpile objectives included $2,686,449,000 for metals and minerals. Value of stockpile metals and minerals on hand acquired under the previous stockpiling act is estimated at $77,860,403 (original cost, $43,671,356).

Aluminum — Efforts of the aluminum industry to keep pace with expanding demand have been handicapped by power shortages. Larger electrical generating plants were built to meet the needs of the industry during the war period, but these are now called upon to supply needs of other manufacturing enterprises which have sprung into being in the postwar period. Power output also was curtailed sharply in the West and South by severe drouths early this year. Lack of industrial gas has prevented the reopening of some aluminum plants. Despite these handicaps, aluminum production now is setting a record peacetime pace of about 585,000 tons per year. This compares with record peacetime productions of 571,750 tons in 1947 and 409,630 tons in 1946.

Demand for aluminum mill products has been stimulated by shortages of other materials such as steel and galvanized iron. In addition, a growing demand for aluminum has arisen on its own merits. Despite the almost universal surge of prices for most other materials, the basic price of aluminum declined from 20.00c in 1939 to 15.00c at present.

Despite operating difficulties, additional facilities will be put into operation this year. Permanente Metals Corp. will reactivate its Permanente, Calif., plant by establishing an aluminum foil mill at that location. Machinery of an entire German aluminum foil mill, purchased by the company last December, is being shipped to this country and will be

ALUMINUM

(Net Tons; U. S. Bureau of Mines)

Year	Primary Production	Primary Apparent Consumption	Secondary Production
1948			
Jan.	48,767	.....	.....
1947	571,750	570,923	150,000*
1946	409,630	461,877	203,976
1945	495,060	797,220	298,387
1944	776,446	744,627	325,645
1943	920,179	877,349	313,961
1942	521,106	588,969	196,464
1941	309,067	302,788	106,857
1940	206,280	227,017	80,362
1939	163,545	167,646	53,947
1938	143,441	89,523	38,800

* Estimated

installed this summer with actual production scheduled to start late this year.

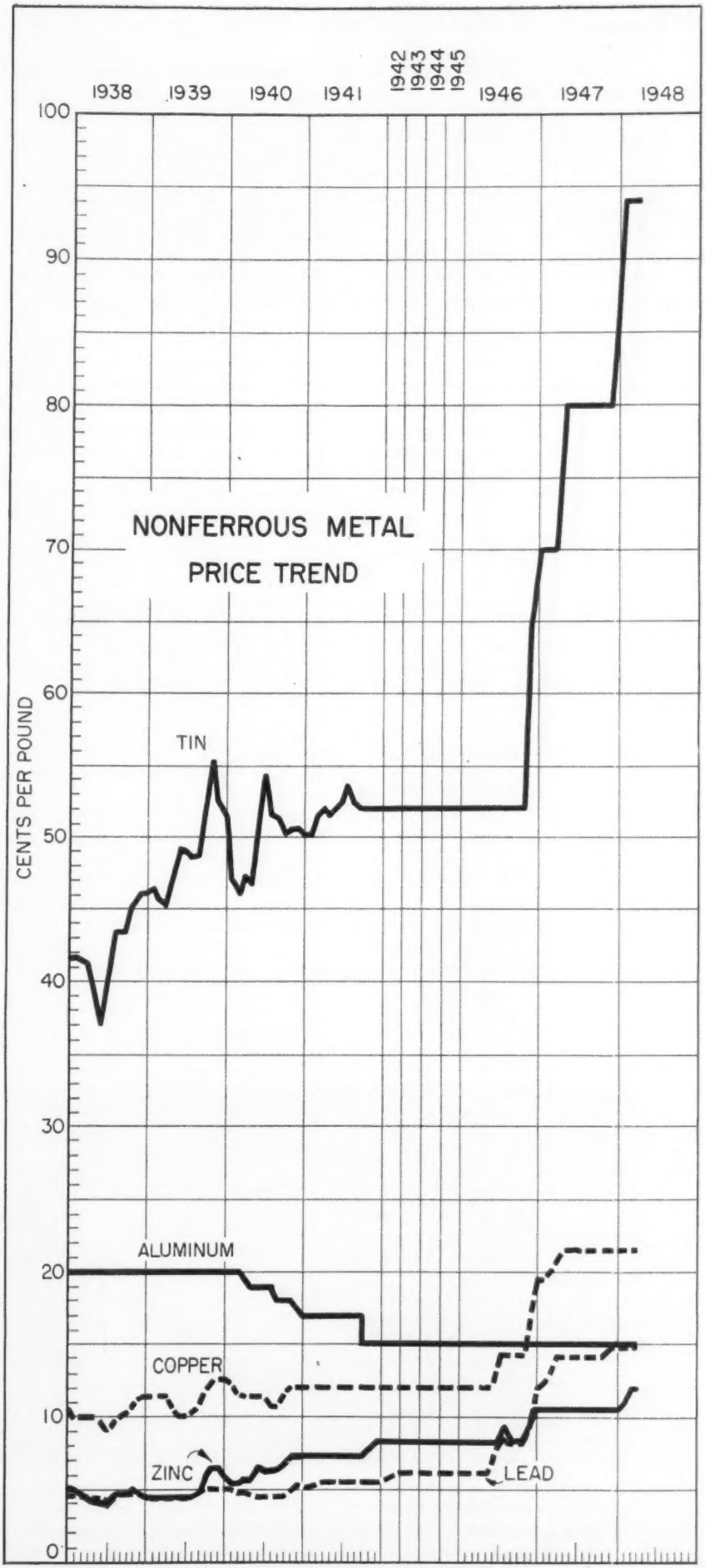
Reynolds Metals Co. hopes to reopen the government-owned plant in Grand Rapids, Mich., which it leases, this summer. The plant was closed about a year ago because of a cutback in orders for extruded aluminum, but there has been an upturn in demand since then.

Aluminum Co. of America's $150 million program of major improvements, started last year, is progressing well and several of the projects are nearly finished. A new rolling mill for production of aluminum sheet and plate at Davenport, Iowa, is nearly completed but actual operations have been delayed indefinitely due to lack of certain equipment. Construction is also nearly complete on a new die-casting plant at Hillside, Ill. Several foundries, including the one at Bridgeport, Conn., have been remodeled and modernized for more efficient production. Plans are being drawn for a new wire, rod and cable mill at Vancouver, Wash.

Lead — Recent labor trouble in the Mexican lead industry has increased tension in the domestic market for that metal and has intensified the critical supply situation. Leading sellers advanced the price of lead 2½ cents a pound last week to the all-time record level of 17.30c, St. Louis, for the common grade. The previous price had been in effect since Mar. 3, 1947.

During the last six months the world price has advanced substantially with the result that lead consumers here have been purchasing foreign lead at a delivered price considerably in excess of the domestic market. The present price of foreign lead is now between 17.00c and 18.00c, delivered New York. Domestic

(*Please turn to Page* 142)



Procurement Machinery Oiled

Survey of industrial plants to determine war potential and to allocate capacity among the armed services is mapped by Munitions Board

UNCLE SAM is tuning up and reorganizing the machinery for the procurement of materiel.

The Munitions Board of the National Military Establishment has drawn up a program for the "Allocation of Private Industrial Capacity for Procurement Planning of the Armed Services" and has announced that the services are undertaking a survey of 11,000 industrial plants to determine what, how much and how soon they can produce materiel. Later this survey will be extended to cover between 22,000 and 25,000 plants accounting for 90 per cent of the country's productive capacity.

Public Law 413, setting up uniform procurement policies for the three services, goes into effect May 19, and purchasing officials of the Army, Navy and Air Force are studying its provisions. Procurement policies of the three services are expected to be lined up on the new basis by July 1.

No Rush of Orders—These preparations do not necessarily presage an early rush of orders for military equipment. In fact, orders over the next several months likely will be modest. Emphasis will be chiefly on aircraft, to which the bulk of materiel funds is allocated.

Aircraft plants already are feeling the impetus of the expanded military preparedness program. Boeing Aircraft Co.'s plant at Seattle, for example, has been awarded a contract for 27 C-97 stratofreighters, involving about $20 million. Boeing had an original order for three of these in 1943 and later received a second order for ten more. The C-97 is a 300-mile-an-hour plane, with a range of 3100 miles, and can carry 140 fully equipped troops and 41,000 pounds of cargo.

Boeing Seattle also has contracts for 215 B-50s, the advanced version of the B-29. Total order backlog is about $240 million. Employment has increased from 10,000 in the fall of 1945 to 18,000 at present.

Defense Installations Pushed — Certain defense installations already started are likely to be accelerated. These include such projects as the enlargement of the Hanford Works in eastern Washington and the installation of military facilities in Alaska. Details regarding these are not available but it is no secret that they have been drawing heavily on steel and manpower in the Pacific Northwest. The Alaska Railroad has improved its facilities and added considerable rolling stock in preparation for increased traffic.

The expanded preparedness program does not provide for large-scale procurement of materiel other than aircraft—yet. About $500 million will be spent for fast tankers and troop transports and another $500 million for all other types of armament. While considerable, these hardly bulk large in comparison with military buying during the war. The materiel program, of course, may be increased sharply in the months ahead, particularly if this country renews lend-lease of military equipment to Western Europe.

To Take Capacity Inventory—The Munitions Board is planning for mobilization for any eventuality. First major step in this program is the inventorying of private industrial capacity and the allocation of this capacity for the procurement planning of the three armed services.

Objective of this move is to expedite the transition of industry from production of goods for peacetime consumption to meeting the requirements of the armed services of the United States and its allies as well as the civil economy during a war emergency.

Representatives of the armed services will visit many plants over coming months to catalog equipment, manufacturing area, personnel, research facilities, transportation facilities, expansion possibilities and many other facts.

Specific objectives of this program are:

1. To determine where necessary materiel, based on mobilization requirements, can be obtained, with particular emphasis on those items likely to be most critical in a future war.

2. To assist in the orderly distribution of the initial increment of the wartime manufacturing load by means of allocating production capa-

(*Please turn to Page* 158)

STEEL EXPANSION?

Building of one or more steel plants with government funds has been proposed to the National Security Resources Board, the President's top advisory body having to do with mobilization of industry in event of war emergency. The project springs from the belief of some government officials that present steel capacity would be inadequate in case of another global war, and that the steel industry should not be expected to bear the expense of building additional plants which would be a part of a national defense program.

While the project has not yet assumed more than a vague outline, proponents talk of capacity for producing 5 to 10 million tons in plants built at tidewater points where foreign ore could be used. It is proposed to obtain foreign ore through barter deals with countries benefiting under the foreign aid program.

Renewed activity is noted at Boeing Aircraft Co.'s Seattle plant, where stratofreighters and superbombers are being built again. Above is an aerial view of the Boeing No. 2 plant, built during the war. It is quarter mile long, a fifth mile wide, covers 42 acres. NEA photo

Mammoth AFA Meeting To Be Held May 3-7

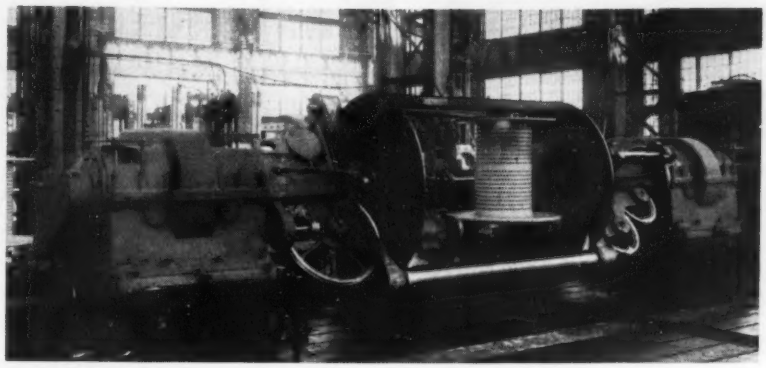
COMPLETED PLANS for the 1948 congress and show of American Foundrymen's Association to be held in Philadelphia May 3-7 indicate the show will be one of the largest in AFA history and the technical program will be one of the most comprehensive. Attendance is expected to exceed 18,000 persons.

Some 260 suppliers of equipment, raw materials and services to the foundry industry will fill Philadelphia's Municipal Auditorium, scene of all day-time activities, with their exhibits, containing more new equipment for the industry than has been displayed at any AFA show since 1930.

Technical sessions, which will include formal papers, panel discussions, and instructional lecture courses, insofar as possible have been scheduled so that specialized casting groups will be able to attend applicable meetings in a minimum number of days. Aluminum-magnesium, brass-bronze, educational and malleable sessions are grouped on Monday and Tuesday; pattern practices on Tuesday and Wednesday; sand on Wednesday and Thursday; and gray iron and steel on Thursday and Friday.

Quality Control Emphasized—Three lecture series offering practical operating information are planned. Two of these, shop courses sponsored by AFA's Gray Iron and Sand divisions, have been a popular annual event and will be held in night sessions. The third, which resumes the traditional series of the Annual Lecture committee, will be devoted to quality control test procedures. This course will be presented daily Monday through Thursday, covering in this order aluminum-magnesium, brass-bronze-nickel, malleable iron, gray iron and steel.

Five outstanding technologists will serve as lecturers: E. V. Blackmun, chief works metallurgist, Aluminum Co. of America, Cleveland; William Romanoff, vice president, H. Kramer & Co., Chicago; Myron O. Booth, manager, Saginaw, Mich., malleable iron plant, Central Foundry Division, General Motors Corp.; Fred J. Walls, Detroit section manager, International Nickel Co.; and John W. Juppenlatz, chief metallurgist, Lebanon, Pa., Steel Foundry.



CABLE STRANDER: Five cable stranders, specially designed by Western Electric Co. engineers to help meet the heavy demand for telephone cable, have been completed at the Eddystone plant of Baldwin Locomotive Works. The machines, one of which is shown above, will strand 26, 51 and 101 pairs of 19, 22, 24 or 26 gage wire into cable at 600 linear feet per minute

"Must" Controls Seen Inevitable

HOW THE SCREW machine products industry can improve its status, and an appraisal of conditions which it faces in the troubled period ahead came in for discussion at the National Screw Machine Products Association meeting in Chicago Mar. 31-Apr. 3. Attendance was approximately 300.

Oliver F. Fancey, industry consultant, Washington, and head of the Screw Machine Products Section, WPB, during the war, reviewed the Washington outlook today — and prospects after the 1948 election. Regardless of which party wins the election, the speaker pointed out, this country will pursue a strong military program. The question then is whether a national defense program can be absorbed by our economy without rigid controls.

OIC Demise Expected—Mandatory controls are inevitable, and the Office of Industry Co-operation will expire, in his opinion. If voluntary allocations requirements being mentioned for the petroleum industry are recognized, this program, plus the railroad car building program now in operation, would earmark 20 per cent of the country's finished steel output. This, in itself, he argued, would disrupt the distribution of steel, and European Recovery Program would further aggravate the picture.

Orrin B. Werntz, NSMPA executive secretary, Cleveland, urged the membership to co-operate promptly and in full with the Department of Commerce in the Census of Manufactures. He pointed out that in the questionnaires now distributed the screw machine products industry has its first chance to be recognized as a separate industry.

During the four-day convention, the association made an attempt to ascertain why its member companies were not favored with the same amount of business in 1947 as in previous years. Aim is to arrest the downward trend of the association's business index. Cause is believed to be that manufacturers who formerly purchased their screw machine products are now making their own.

C. E. Wilson To Speak at Triple Mill Convention

C. E. Wilson, president of General Electric Co., will be the principal speaker at the Triple Mill Supply Convention which will meet in Atlantic City, N. J., April 26-28.

The meeting, which is sponsored jointly by the American Supply & Machinery Manufacturers' Association, the National Supply & Machinery Distributors' Association and the Southern Supply & Machinery Distributors' Association, will hear Mr. Wilson speak on "America Is Your Business." Willard L. Thorp, assistant secretary of state for economic affairs, will discuss the Marshall Plan.

Dr. R. C. Hutchinson, president of Lafayette College, will speak on "This Democracy." Fred Hall, Kiekhaefer Corp., has as his subject "Top Side Interest in Firing Line Problems." F. J. Tone Jr., vice president of Carborundum Co., will discuss "Selection of Salesmen." Nathan H. Gist of New York, will speak on "Can Our American Economy Survive?"

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Further tax reductions still talked, but considered unlikely this year. Both houses pass income tax relief over President's veto, cutting $4.8 billion from federal income

ALTHOUGH some Republican congressmen still talk about the possibility of revising excise and some business taxes this year, consensus in Washington is that Congress will be content with the personal income tax reduction enacted over the President's veto. Talk of further tax reduction is predicated on the condition "if we can afford it."

As a matter of fact, some congressmen acknowledge that future taxes may have to be raised to finance the expanding military preparedness and foreign aid programs. If so, they say, the increases will be imposed on the more equitable base established by the new tax measure.

The income tax reduction bill will reduce federal income by an estimated $4.8 billion. The Republicans believe the reduction can be made without cutting into the costs of the European Recovery Program and proposed military expenditures.

President Truman in his veto message asserted the measure would create a federal deficit and increase inflation.

Majority Overwhelming—The Chief Executive's objections to the bill were swept aside by overwhelming majorities in favor of tax reduction. The House voted 311 to 88 to override the veto, 45 votes more than the required two-thirds. The Senate completed enactment of the bill by a 77 to 10, or 19 more votes than necessary to override.

The new income tax law increases personal exemptions from $500 to $600; raises maximum standard deduction for state taxes, gifts etc., from $500 to $1000; permits married couples to split their incomes for tax-filing purposes in all states; reduces levies on a sliding scale from 12.6 per cent in the low brackets to 5 per cent in the high brackets.

An estimated 7.4 million small taxpayers will be freed of paying any income tax. The remaining 47 million will pay lesser amounts depending on their income, number of dependents and place of residence. For example a married man, living in a non-community property state, would pay about $500 less on a $10,000 income, $3100 on a $25,000 income, and about $31,000 less on a $200,000 income.

New Forms Rushed—New withholding tables and other documents to inform employers and taxpayers of their liability under the new tax law are being rushed through the printing presses and will be distributed before May 1, when the lower payroll deductions become effective. New deduction schedules are based on a 15 per cent levy, after allowance for dependents.

Where overpayments have been made in the first four months, these will be refunded after the 1948 tax return is made. However, most people in the upper brackets will find that the withholding (on the 15 per cent basis) will be inadequate to cover the tax liability and will be expected to make quarterly supplemental payments.

Scrap Bill's Prospects Dim

Chances of enactment of S. 2109, introduced by Senator Edward Martin (Rep., Pa.) "to relieve the critical shortage of iron and steel scrap" are considered not so good in view of the fact that Army, Navy and Air Force in recent weeks have decided to review all unsold surplus goods with a view to retaining everything that might be useful in war emergency.

S. 2109 would force all government agencies to dispose of scrap and potential scrap within stated periods and thus prevent repetition of the delays incident to government scrap disposal in the past. The bill was drawn up particularly to put the heat on the War Assets Administration. Under the new policy of the National Military Establishment the three armed services are expected to take back much property they had declared surplus.

Move To Tighten Lobbying

First action of the attorney general under the Federal Regulation of Lobbying Act, against the United States Savings & Loan League, is expected to encourage registration of many organizations and individuals who heretofore have taken the position that they did not need to register. This is applicable particularly to outfits located outside of Washington; the United States Savings & Loan League has headquarters in Chicago, with branch office in Washington. A non-profit organization, the league was indicted on the ground that its principal purpose is to influence, directly and indirectly, legislation by Congress. The case was presented Mar. 30 to a federal grand jury in the District of Columbia.

Steel Hearing Resumes Apr. 13

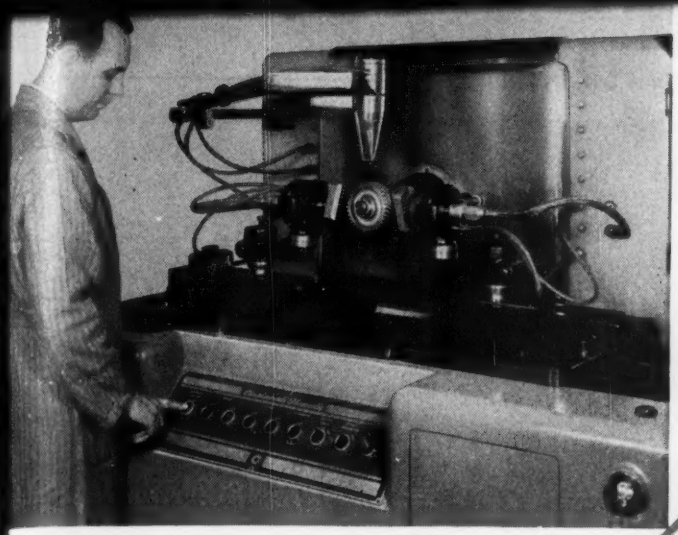
Walter S. Tower, president, and George S. Rose, secretary, American Iron & Steel Institute, will appear for questioning Friday, Apr. 16, in the steel pricing case of the Federal Trade Commission. The hearing will be held in the third floor auditorium of the FTC building in Washington. Both witnesses have been asked to bring documents and are expected to occupy the stand for several days.

Hearings in this case will be resumed Tuesday, Apr. 13, with Tuesday, Wednesday and Thursday devoted to the entering of exhibits. These will consist mainly of analyses of the price data recently submitted by the respondent steel companies, and prepared under the direction of Trial Attorney Lynn C. Paulson.

The postponement from Apr. 6 to Apr. 13 was decided on to accommodate one of the attorneys in the steel case, John C. Bane Jr., Pittsburgh, who also is counsel for the United States Steel Corp. in the Pittsburgh Plus case. Mr. Bane had to prepare a brief in the latter case for presentation to the Third Circuit Court of Appeals, Philadelphia, Apr. 10. FTC counsel must file its brief in that case by June 10 after which the corporation counsel will make a reply. Indications are that the court will set a July date for argument of this famous case which has been pending since 1924.

Patent Infringement Bill

Chances for House approval of H. R. 3929 which would give the government a special defense in patent infringement suits now are regarded as practically nil. Under this bill anybody trying to collect a royalty on the use of his patent by or for the government, or suing for infringement damages, would be confronted with any written disclosures that the particular procurement agency might be able to dig out of its files. In hearings just concluded by the Subcom-



HERE'S HOW flamatic SURFACE HARDENING CAN SAVE YOUR MONEY

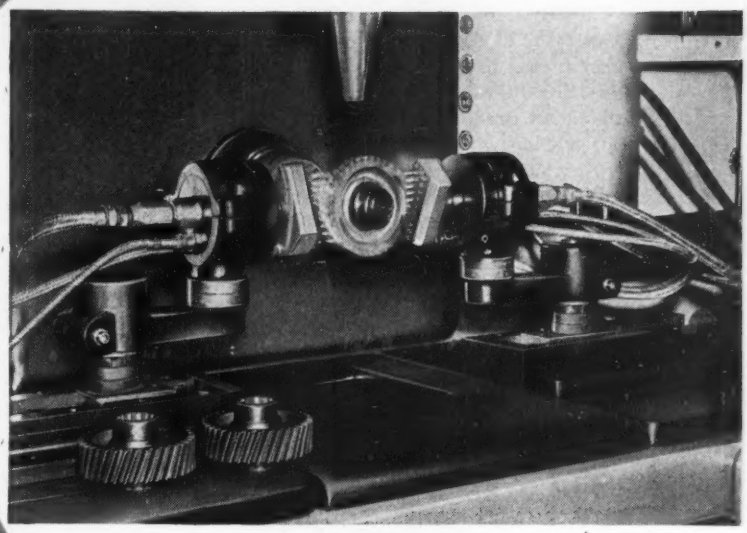
Patents Pending

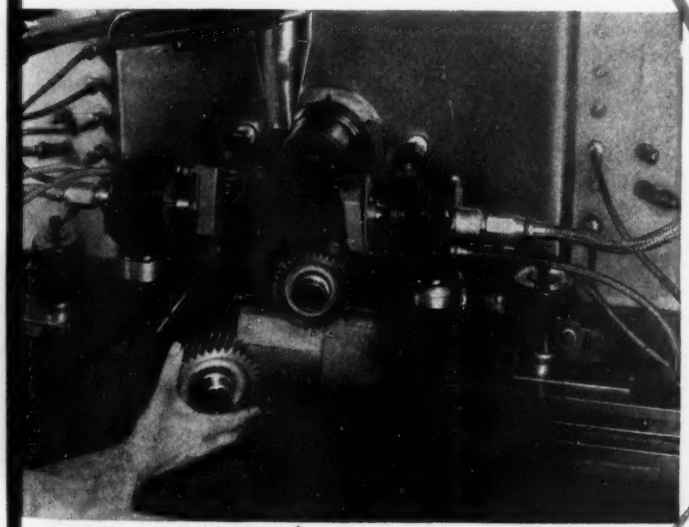
load work then touch button

Operator simply places work (gears, shafts, pinions, cams, etc.) on arbor or holding fixture – touches button, and lamatic does the rest. Work rotates, flames ignite and rapidly heat surfaces while

the electronic eye watches temperature

Exclusive Flamatic feature, electronic temperature control permits extremely fast heating of part to within plus or minus 5°F of desired preset temperature, and at this instant . . .



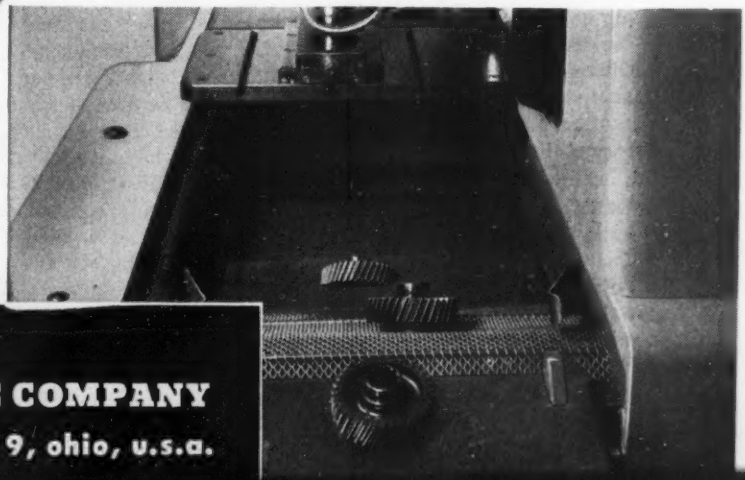


part is deposited into quench automatically

Faster than can be done manually, a relay causes the work-holding fixture to retract, "stripping" the work off and depositing it into the thermostatically controlled quench and onto an endless conveyor in the tank.

parts come clean

Delivered out of quench on conveyor. pid heating and controlled depth of heat penetration result in uniform hardness and hardness gradient, extremely low distortion, and elimination of subsequent machining operations. Write today for new 20-page illustrated Flamatic Catalog: Publication M-1611.



HE CINCINNATI MILLING MACHINE COMPANY

CINCINNATI

cincinnati 9, ohio, u.s.a.

mittee on Patents, Trademarks & Copyrights of the House Judiciary Committee, patent attorneys and spokesmen for industry were unanimous in opposing the bill. They pointed out that in view of the secrecy surrounding so many inventions during and since the war, there is no way of knowing what disclosures reside in government files, nor the dates they bear, so that claimants for infringement damages would be placed in an unfair position.

Uranium Search Being Pushed

The Department of the Interior has advised the U. S. Atomic Energy Commission that in accordance with a request from the commission it has approved an order (Public Land Order 459) withdrawing from entry and reserving for use of the AEC approximately 40 square miles of public lands in southwestern Colorado. During the coming summer the commission plans to diamond drill the reserved area in search of uranium deposits. It is expected that lands found to contain uranium will become available for development and mining by private interests under arrangements with the government.

The exploratory drilling operation will be conducted for the AEC by the U. S. Geological Survey. In addition to this activity, the Commission also plans this summer to initiate in the Colorado Plateau area limited buying of uranium-bearing ore preparatory to operating a processing plant at Monticello, Utah, recently purchased from the War Assets Administration. The ore buying and processing program of the Commission will likely be expanded later.

Export Panels To Be Formed

Nominations of representative exporters to serve on Office of International Trade commodity advisory panels and committees have been requested. The panels, which will include representative merchant exporters and manufacturing exporters, are being selected for the purpose of securing closer co-operation between the Office of International Trade and exporters engaged in shipping those commodities affected by OIT's new export licensing policies.

Nominations will be accepted from trade associations concerned with the export of particular commodities, from boards of trade, chambers of commerce, members of the long-established OIT Export Advisory Committee, the Commercial Intelligence Division of the Department of Commerce and regional directors of the Department of Commerce throughout the country. In addition, nominations are restricted to policymaking and executive heads of export operations of business firms represented, OIT said.

Each advisory panel will consist of 25 to 30 business men directly active in a particular commodity field. Small task committees will be drawn from these panels to study licensing problems and other matters of concern to the trade as they arise.

Secretary of the Senate Carl A. Loeffler signs the income tax reduction bill which becomes effective May 1, after both Senate and House had voted to override the President's veto. Looking on are, left to right: Sen. Eugene D. Milliken (Rep., Colo.), chairman of the Senate Finance Committee; Rep. Harold Knutson (Rep., Minn.), author of the bill and Speaker of the House Joseph Martin Jr.—NEA photo

Warns About Export Licenses

United States firms desiring to ship products to European countries for display at international trade fairs and exhibits are cautioned to obtain export licenses for such shipments. OIT announced in view of the increased shipment of American products abroad for exhibit purposes and the growing interest of many firms in having their products displayed at international fairs held in foreign countries, unnecessary complications may be avoided if exhibitors and exporters are fully aware in advance that an export license is necessary.

License-free shipments may be made only if the value is less than the General License Value (GLV) limitation established by OIT regulations. Under the GLV license, shipments of commodities not on the Positive List, valued at less than $100, may be made to Group R countries without applying for a license. Specific dollar value limitations are placed on GLV shipments of items on the Positive List of commodities in short supply.

Export license application blanks (Form IT-419) for shipments to European countries may be obtained from all Department of Commerce field offices.

NBS in Electronics Research

National Bureau of Standards, effective Apr. 1, changed the name of its Ordnance Development Division to the Electronics Division. The reason: Most of the work of the division has to do with electronics. Most of the projects continue to be carried on behind closed doors and the bureau explains only that they have to do with such developments as radio proximity fuzes, guided missile controls, etc. Latest major feat of the division is the invention of a new magnetic fluid clutch which transmits up to 20,000 pulses per second and which brings driven apparatus up to full speed in one two-thousandths of a second.

Pacts Promote French Recovery

France to get Polish coal under new agreement. Trade with Italy to be tripled. Discussions on joint problems held with Swiss. Reds foment coal mine walkout

PARIS, FRANCE

NEW TRADE AGREEMENTS negotiated by France with Poland, Italy and Switzerland generate the hope that consolidation of European economic relations is actually progressing.

The five-year Franco-Polish pact guarantees to France delivery of substantial quantities of coal, vital in its recovery efforts. Poland is to receive automobiles, trucks and electrical equipment.

Value of French products to be delivered to Poland through 1952 is placed at $60 million. Poland will furnish 1.5 million tons of coal in the first year, increasing the amount yearly until in 1952 2.5 million tons will be shipped.

Optimism over the signing of this pact is tempered by the knowledge that operation of the previous Polish trade agreement was seriously hampered by the Polish government, and Frenchmen want to see results before acclaiming this pact.

The Italian agreement, concluded Mar. 20 at Turin, will serve as a basis for a series of commercial arrangements, which in the coming year are expected to triple the amount of goods exported by the two countries. Under these pacts, value of projected 1948 exports by each country to the other would be 15 billion francs.

The Swiss pact, which provides that the Swiss franc be sold on the new open money market in France, was ratified in Paris by a joint commission which has been discussing Franco-Swiss trade and financial problems of the two countries for several weeks.

Coal Mining Disrupted—A communist-instigated strike of 30,000 coal miners in northern France, causing loss of 20,000 tons a day, although settled after 48 hours was branded by the French minister of industry and commerce as having "no justification." The strike, according to union leaders, was to warn the government that wage increases are essential to offset inflation and to protest against removal of communists from high positions in the government-operated coal mining industry.

Prior to the strike coal production had moved to the highest point since the liberation, and January's output of 4,750,000 tons was 20 per cent greater than 1938's average monthly production. Coal imports in January had been about 18 per cent less than in December, however.

Production Shows Gains—French production as a whole has improved materially since the strikes in November and December, despite signs of increasing activity of communists, who are trying to take advantage of the people's dissatisfaction over increased cost of living and the government's system of forced loans.

Steel production in January was almost as high as in October, 1947, the best month of last year. Last year's strikes, however, resulted in the country's yearly output being 200,000 tons short of 1938 production, last year's goal. Pig iron production in January at 459,000 tons was up 18 per cent over the previous month and amounted to 91 per cent of the monthly average for the year 1938.

Output of hot-rolled steel moved to 117 per cent of the 1938 monthly average in January, a rise of 27 per cent over December. The January rate, however, was only 73 per cent of this year's monthly target, with insufficient supplies of coke from the Ruhr blamed.

Bank Loans To Aid German Firms

DUSSELDORF, GERMANY

TWO LOANS, made recently by German banks to German metalworking companies, are hailed here as the most important which have been arranged since the war's end. One involves 125 million marks to the newly established steel companies of the Ruhr, formed under the deconcentration law. The other for a like amount is to Rheinmetall-AG, Dusseldorf, a leading steel processor and machinery manufacturer.

The credit to the Rheinmetall firm will be used for reconstruction of its heavily dismantled and bomb-damaged plants.

The loan to the steel producers is expected to bolster their precariously weak financial structure. All of these companies are deep in the red and are heavily subsidized by the public treasury. The loan is regarded as involving a substantial risk because the companies own practically no assets, working their facilities under rental agreements with the original companies from which they were separated.

Waste Involved in Dismantlings—The Krupp organization, now dismantling its Essen-Borbeck steel works and shipping it piecemeal to the Soviet Union, has compiled figures to show the size of the undertaking. Dismantling began in February, 1946, with several thousand men employed. It will take another two years to accomplish; meanwhile a tremendous quantity of freight car space is required for the movement of parts and equipment. This plant's dismantling will cost about 20 million marks, but only 9.5 million marks will be credited to the reparations account for the work. Cost of a comparable new plant would be about 120 million marks.

More important than the manpower, materials and transportation involved in the plant's removal is the economic loss to all Europe which Germany feels the dismantling entails. The Russians estimate that with the recovered material they will be able to build plants of only 10 to 20 per cent of the original plant's capacity, with the remainder of the structures being good only for scrap. Germans contend the facilities would be of more value if they were now producing structurals, sheets, tubes, etc. for reparations account.

Ore Imports Lag—Problems are being encountered in obtaining as much Swedish iron ore as German furnaces need. Originally import of 2.5 million tons of ore during the first half of this year was planned. At that time steel production was set at 4.8 million tons. With the lifting of Germany's steel production ceiling to 6 million tons, increased imports of Swedish ore were contemplated. So far contracts have been signed for only 1.4 million tons of ore.

Sweden wants payment for more ore made by increased deliveries of German rolling mill products and of German scrap, but scrap dealers contend prices are too low and rolling mills claim their books are filled for other accounts. Furthermore, the insistence by occupation authorities that most German exports be paid for in dollars is restricting the amount of German-Swedish trade.

Belgium, Luxemburg

Exports of iron and steel products

from Belgium and Luxemburg reached a record high in January at 253,135 metric tons. This compared with the prewar peak of 237,086 tons. Principal products exported were merchant bars, 72,325 tons; structurals, 40,265 tons; plates and sheets, 35,635 tons. Trade with free markets is brisk.

Wire rods to Greece have recently been quoted at $147.72 cif, reinforcing concrete bars to Venezuela at $159 to $164 according to diameter, and galvanized corrugated sheets, 24 gage, to South Africa at $287.50 fob Antwerp.

The following tonnages have been allocated to organized markets for the current quarter: Denmark 36,000 tons; Finland 18,000 tons; Norway 24,000 tons; Sweden 62,000 tons; the Netherlands 140,000 tons; Portugal 25,000 tons. Quotas for France and Great Britain have not yet been fixed.

Price of steel scrap in Belgium has come down by $4.54 a ton. Imports, priced at about $20 a ton fob port of shipment, are excluded from this reduction. Ten thousand railroad cars to be scrapped over the next two years are expected to provide an additional source of steelmaking scrap.

Great Britain

A trade agreement with the Netherlands provides for shipment of 50,000 tons of British steel products in a year.

Scunthorpe steelworks of Appleby-Frodingham produced a record-breaking tonnage recently with 17,884 tons of ingots poured in four weeks. During the same period, the mill's plate production reached a new high of 26,247 tons.

Italy

High labor costs in the Italian automobile industry is making competition in foreign markets extremely severe. Production in other fields is increasing, however, as the result of more plentiful supply of electric power. Steel ingot and casting production in 1947 was estimated at 1.7 million metric tons, and pig iron output was 320,000 tons.

The Netherlands

One of continental Europe's largest importers of iron and steel is the Netherlands. Last year 799,100 tons were imported, which compared with 638,890 tons in 1946 and 1,250,230 tons in 1939. Leading supplier was Belgium and Luxemburg, followed by the United States and Great Britain. American exports to the Netherlands in 1947 totaled 212,870 tons, slightly more than one-quarter of total imports, against 113,000 tons in 1946.

Facts for Industry . . .

(As reported by government agencies)

Wrought Magnesuim—Shipments of magnesium wrought products in February were up 31 per cent over January, totaling 413,000 lb. Extrusions accounted for 284,000 lb of the total, the remainder being in the form of plates, sheets and strip. Not included in the total were extruded sheet stock, extruded sticks and powder, whose production is relatively insignificant. *Census Bureau, Commerce Dept.*

Lawn Mowers—Value of lawn mowers shipped in 1947 was double that for 1946 and totaled $71,053,263, representing 2,613,593 units. Hand lawn mowers accounted for 85 per cent of the total number of units. Production in 1947 totaled 2,724,077 units, an increase of 74 per cent over 1946 output and was the highest on record. *Census Bureau, Commerce Dept.*

Furnaces—Factory shipments of warm air furnaces fell 31 per cent in January, compared with December, totaling 46,643 units and valued at $8.0 million. Inventory of completed furnaces rose 28 per cent to 70,572 units, over a month's production at the January rate. Solid fuel furnaces represented 42 per cent of the total shipped, oil-fired furnaces 35 per cent, and gas-fired 23 per cent. Three-fourths of the shipments were of steel furnaces; the remainder of cast iron. *Census Bureau, Commerce Dept.*

Air Conditioning Equipment—Fourth quarter, 1947, shipments of complete air conditioning and commercial refrigeration equipment and parts were valued at $43.2 million. Shipments in third quarter were valued at $43.9 million. Shipments of the major classes of components and accessories were virtually unchanged, but self-contained air conditioning units were off 33 per cent to $6.1 million and ice-making machine shipments were off 10 per cent to $564,000. *Census Bureau, Commerce Dept.*

Metal Cans—Fifteen per cent less tonnage of metal cans was shipped in January than in December, January's total amounting to 216,244 short tons, of which 181,371, or 84 per cent, were for sale. The remaining 34,873 tons were for producers' own use. January's decrease was largely in fruit and vegatable cans which accounted for 49,736 tons of the total. Non-food cans shipped in January weighed 81,814 tons, down 2 per cent from December. *Census Bureau, Commerce Dept.*

Castings—Malleable iron castings shipments amounted to 75,194 short tons in February, compared to 77,744 tons in January. Of the total, 42,582 tons, or 57 per cent, were for sale to the trade. Net new orders booked for sale to the trade during the month totaled 46,270 tons, 6 per cent below January. *Census Bureau, Commerce Dept.*

Steel Barrels — Production of steel shipping barrels, drums and pails comprised 2.2 million heavy-type and 878,759 light-type barrels and drums and 4.7 million steel packages, kegs and pails in January. Heavy barrel production was off 6 per cent from December; light barrel output was down 2 per cent and package turnout was 9 per cent lower. Order backlogs for heavy-type barrels totaled 12.2 million units on Jan. 31, for light-type 2.7 million and for packages, kegs, and pails 21 million. *Census Bureau, Commerce Dept.*

Construction—New construction put in place in March is estimated at $1,088 million, compared with $926 million in February. Private construction totaled $852 million (up 13 per cent) and public construction totaled $236 million (up 37 per cent). *Office of Domestic Commerce, Commerce Dept.*

Mineral Reports—Twelve small deposits, estimated to contain 187,000 tons of lower-grade bauxite, are described in "Margerum Bauxite District, Colbert County, Ala.," (investigation 4207); and diamond-drilling work following a preliminary geophysical survey in Crittenden county, Ky., is described in "Stalion-Curnel Flourspar Prospect" (investigation 4205). *Publications Section, Pittsburgh, Bureau of Mines, Interior Department.*

Oil Field Steel Needs Pressing

Tank and oil field production equipment makers report exhausted steel inventories force curtailed output despite increased demand

TOTAL steel requirements to enable the petroleum industry to meet its estimated demands, as reported in STEEL (Mar. 22, p. 141), are placed at 15,571,500 tons for the 18 months, Apr. 1, 1948, to Sept. 30, 1949, by the Committee on Petroleum Industry Steel Requirements in a report in connection with the voluntary steel allocations program.

Requirements of steel forgings and castings total 951,984 tons for the 18-month period. Categorized according to end use, steel requirements are listed as follows:

For oil and gas production, oil pipelines, refining and marketing and plant facilities, 7,707,900 tons for the period; for natural gas transportation from the gathering systems up to the city gate, 2,191,900 tons. In addition, there are essential needs for allied phases of the industry's operations, but steel used in these categories is for the most part charged to other industries. For example, total steel needs are estimated at 1,496,600 tons for this period for containers; 1,120,400 tons for tankers, barges, tank cars and truck tanks; 1,340,300 tons for consumer storage. Steel for projected operations in foreign activities is estimated at 1,714,400 tons for the 18-month period.

Petroleum Advisory Committee Meets — Seen as a step toward implementing these and other recommendations has been the recent appointment of the Petroleum Advisory Committee by Secretary of Interior J. A. Krug. The group has held its first meeting and Max W. Ball, director, Oil & Gas Division, was made acting chairman. The committee will meet again Apr. 14.

Formulation of more definite programs than those now temporarily in effect is the first objective of the group. Discussion centered on the inclusion of gasoline, need for speed in reaching decisions and various phases of the temporary plan of allocation and distribution of petroleum which was initiated in late January. It was also announced that the time limit of the voluntary program has been extended from Mar. 31 to Apr. 30 and that, when approved by the National Petroleum Council, the program will be broadened to include gasoline where parts of the temporary plan were limited to fuel oils.

Face Knotty Problems—One problem slated possibly for study by this and other groups in the Office of Industry Co-operation is that disclosed by manufacturers of bolted steel tanks, oil and gas separators, heaters and treaters, welded oil field production tanks and related equipment for oil producers. They report their steel inventories are exhausted and that they have been forced to curtail production in spite of increased demand. This was the situation revealed at a recent meeting in Kansas City, Mo., of the Tank & Oil Field Production Equipment Manufacturers, held at the suggestion of the petroleum committee of OIC.

At this gathering requirements were studied for drill pipe, casing and tubing as submitted to OIC by the Independent Petroleum Association of America which estimates that 1,450,000 tons of steel in these categories will be needed in 1948; 1,475,000 in 1949; 1,505,000 in 1950; and 1,530,000 in 1951.

Steel Needs Vital—Pointing out that oil at the well head is valueless unless it is separated, treated and tanked prior to shipment to the refinery, the tank and oil field production equipment makers drew up the following requirements for their industry and declared that they must get this steel if the complete oil program is to be implemented successfully.

	Tonnage Required			
	1948	1949	1950	1951
Sheets, heavy hot-rolled, 16 gage and heavier, 85 per cent of which are 10, 12 gage, 60 in. wide	105,000	107,625	110,775	113,400
Plates, 3/16 in. up to and including 5/8 in.	63,308	64,890	66,789	68,372
Plates, over 5/8 in. in thickness	11,172	11,451	11,786	12,066
Structural shapes, including bar size angles and channels and structurals	21,680	22,222	22,872	23,414
Tank bolts	8,260	8,466	8,714	8,920
Pipe	6,460	6,622	6,815	6,976
Heads, flanged and dished	4,150	4,254	4,378	4,482
Total	220,030	225,530	232,129	237,630

Representatives from the following companies attended the meeting: Black, Sivalls & Bryson Inc., Kansas City, Mo.; Parkersburg Rig & Reel Co., Parkersburg, W. Va.; Maloney-Crawford Tank & Mfg. Co., Tulsa, Okla.; Butler Mfg. Co., Kansas City, Mo.; Panhandle Steel Products Co., Wichita Falls, Tex.; Columbian Steel Tank Co., Kansas City, Mo.; M & V Tank Co., Wichita Falls, Tex.; and National Tank Co., Tulsa.

Oil Steel Needs Questioned—Following a preliminary study of the report on the petroleum industry's steel requirements, the Commerce Department is far from satisfied that requests for allocations of steel for that industry would be justified, David K. Bruce, assistant secretary of Commerce, told the House Interstate & Foreign Commerce Committee Apr. 5. Before conclusions can be reached a thorough analysis will be needed.

Commerce, Mr. Bruce continued, expects the report to be gone over

(*Please turn to Page* 159)

Steel Pinch Tightens on Coast

SAN FRANCISCO

STEEL users are preparing for greater shortages of steel than ever this summer. On top of the crippling coal strike, California's power shortage is proving an extra deterrent to production, and the possibility of increasing rearmament contracts, which will siphon steel out of ordinary civilian uses, is a third cloud on the fabricators' horizon.

One by-product of this situation is increasing activity by gray market operators. Steel users on the Coast report a rise in gray market offerings. It is believed that as steel supply is reduced, the price level will rise. At present gray market offerings are at anywhere from two to four times standard mill prices.

For example, sheet users say they are being offered sheets at 12 to 22 cents compared with the warehouse price of 5.90 cents. Reinforcing bars are offered at $105 a ton, $25 over the regular price.

Despite efforts of manufacturers to offset the power shortage by installing oil-fired generating systems, the electricity scarcity continues to make inroads into the western production capacity. American Radiator & Standard Sanitary Corp. had scheduled opening of a new $3 million plant in May, but it now appears doubtful the new operation can begin on schedule.

A new Dodge assembly plant scheduled to begin operation last Mar. 9 hasn't turned a wheel because there's no electricity to be had. Columbia Steel Co. is installing generators at Pittsburg. During recent weeks the company has been operating with 20 per cent less power than normal.

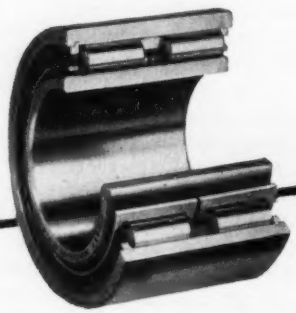
QUIZ GAME

Which would you use as a LUBRICANT for ROLLER BEARINGS?

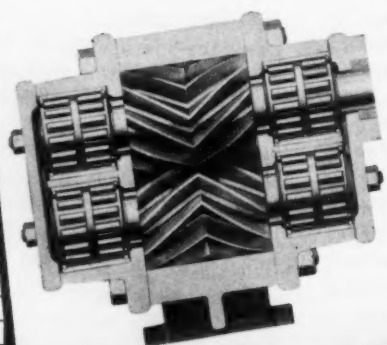
GLUE
TAR
SULPHUR
PARAFFIN
RESIN
ASPHALT

GASOLINE
ALCOHOL
SOAP
INK
GELATIN
VARNISH

LAUNDRY BLEACH
RAYON
THERMOPLASTICS



You Can't Lose! Worthington Rotary Pumps handle *all* of the above items—and many more. And the substance that passes through the pump also serves as the *only* lubricant for the four Hyatt Hy-Load Roller Bearings. Periods of service range from 2 to 24 hours a day, and Worthington reports most satisfactory performance: a tribute to Worthington's sound product design, and selection of Hyatt Roller Bearings.



Success in "unusual" applications like this simply goes to show that in any kind of application—wherever you need dependable bearings you *WIN* WITH HYATT. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Auto industry planning celebration of assembly of 100 millionth car to roll from lines in late summer or early fall. Some favor revival of auto shows at Detroit

DETROIT

EXPECTATIONS are that the 100 millionth car produced by the automotive industry in its half-century history will roll from some assembly line in the late summer or early fall, and the drum-beaters are now pondering just what to do about it in the way of celebration. It is going to be a pretty difficult matter to determine just exactly which one will be No. 100,000,000, since early records are a little hazy and there will be considerable scrambling for the honors of assembling the "car of distinction." A good guess is that it will be a Chevrolet, since this manufacturer has built the lion's share of the industry's aggregate over the years.

There is also the question of when to start counting. Duryea claims to have sold some automobiles as early as 1896, and on the other hand Alexander Winton has gone on record as building and selling the first American-made gasoline buggy on March 24, 1898. If the count is to start with 1900, then it will include 4192 passenger cars for that year, according to records of the Automobile Manufacturers Association. Totals for a number of succeeding years—7000 for 1901, 9000 for 1902, 25,000 for 1905, 210,000 for 1911, etc.—sound suspiciously like rough estimates, so no one can be sure of the exact identity of No. 100,000,000 later this year. At any rate, one model will be selected by the flip of a coin or the draw of the short straw and the gold paint will be slapped on for a gala occasion.

May Resume Auto Shows—Some observers see in the event a logical timing of the first national automobile show to be held in Detroit. It has been seven years since the last auto show, in New York, and there has been little support for resuming them as long as model changes were of little consequence and the public was snatching up everything plants could produce. This situation will be changed by fall, as all three new Ford lines will be in blossom and many other completely new postwar creations in passenger cars will be available for display. Furthermore a suspicion is whispered here and there that the sellers' market of the past three years may be petering out by that time, and the public will be ready for a good jolt of automotive fanfare.

Considerable pressure has developed for moving the national show from New York to the industry headquarters, although a principal drawback still exists in the lack of suitable exhibit hall facilities in Detroit for such an elaborate staging. Plans are on paper for a large new exhibit hall and convention auditoriums at the foot of Woodward Avenue, but they are many years away. Right now the Michigan State Fairgrounds would be about the only place suitable for a national automobile show, and that is some 8 miles from the downtown area.

Hit Million in 1916—Records show the first year auto production eclipsed the million mark was in 1916, when 1,617,708 cars and trucks were assembled. In the first four months of the current year, the industry will have completed well over that number. Output for the first quarter was better than 1,350,000 and April should add at least another 400,000, barring a complete tieup of the U. S. economy by John L. Lewis. March assemblies passed the half-million figure for the first month since June, 1941.

Freight shipments into Detroit were slowing last week because of restrictions on train schedules resulting from the coal strike. It was the start of a creeping paralysis which may take months to correct. Lincoln and Mercury are having a strenuous time with parts and supplies, and assembly schedules on new models consequently are snarled. Some manufacturers have been eating into steel inventories at twice the rate of intake and this cannot continue much longer.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1948	1947
January	422,277	366,205
February	399,452	393,636
March	509,700*	443,583
April	.....	445,137
May	.....	404,191
June	.....	421,466
July	.....	400,944
August	.....	364,478
September	.....	444,501
October	.....	461,536
November	.....	417,493
December	.....	492,109
12 mos.	.....	5,055,284

* Preliminary.

Estimates for week ended:

	1948	1947
Mar. 20	115,556	108,472
Mar. 27	107,284	100,355
April 3	105,046	97,385
April 10	100,000	97,893

Estimates by Ward's Automotive Reports

New Fords Assembled

First of the new Ford model passenger cars—two-door sedans—have been inched off the assembly line at the Rouge Plant and parts shipments have been started to branch assembly plants. By the end of this month, manufacturing facilities will have been fairly well wrapped up for new model production and schedules should accelerate rapidly in May. Layoffs during the changeover were below anticipations, being less than 12,000 at the end of March and recalls were proceeding rapidly. One reason for the reduction in temporary layoffs was a sharp increase in truck schedules, now the highest in the company's history.

Total shipments of Ford trucks in March were 35,563, a new postwar monthly record. Average daily production for 23 working days was 1546 units and output at this pace is slated to continue for several months.

Further details have been obtained on the Ford-Lincoln-Mercury frame manufacturing setup for 1949 models. It was mentioned here last week that Lincoln had changed to a conventional type frame on new models. Known as a K-type, it has deep channel side members, four cross braces and a heavy channel X-member, all welded and riveted together. Frames for the standard Lincoln are supplied by Murray Corp. of America, for the Cosmopolitan by Midland Steel Products Co. Frames for the Mercury are furnished by Murray, schedules calling for 500 daily. Truck frames are split

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SHIPPING SEASON OPENS: Among the first cargoes to be carried on the Great Lakes in the 1948 shipping season was this cargo of Chevrolet passenger cars and trucks shipped from Detroit to Cleveland

between Midland and Murray on the basis of 1500 per day.

All Ford frames will be manufactured on a new frame line installed in a former armor plate plant at the Rouge. Equipment is reported to comprise one of the most elaborate and automatic set-ups ever devised, featuring a large number of automatic welding units. The plant is said to be patterned somewhat after the A. O. Smith frame-building unit in Milwaukee, except that welding has been substituted for riveting. Capacity of the Ford frame lines is 5000 daily. Apparently frames will not be shipped knocked-down to branch assembly plants, as is the case with Chevrolet and its branch plants, but will be stripped to a degree dictated by shipping economics.

The figure of 5000 per day is that established as practical capacity for all departments supplying Ford passenger cars. It includes both domestic production and export shipments. Several months will be required to reach this ambitious production level, if indeed it is ever attained. At least that is what the boys are shooting at.

First British-built Ford cars and light trucks are expected to arrive in this country in the next week or so. Along with service parts, they will be delivered to distributors in New York, Washington, Philadelphia, Boston and Wilmington, Del. Manufactured by the Ford Dagenham Plant, the two-door model is known as the Anglia and the four-door as the Prefect. The 1/4 and 1/2-ton vans are called the Thames. All are powered by 4-cylinder 30-horsepower engines, delivering economy of 30 miles to the gallon.

Working on New Engines

Oldsmobile has announced officially the organization of a so-called "Kettering Engine" Division at its Lansing, Mich., plant. Engineering work on a high-compression V-8 engine has been in progress at Oldsmobile, as well as at Cadillac, Buick and Pontiac, for a number of months, although it has been kept under wraps. The Pontiac foundry has been making block castings on an experimental basis for both Olds and Pontiac experiments. Now the Olds block has been transferred to Chevrolet Gray Iron Foundry Division at Saginaw, Mich. Marvin L. Katke has been named superintendent of the Olds department handling development of the new engine. It is probable that all of these new high-compression V-8 designs will wind up as valve-in-head types, since this arrangement permits better "breathing" of the engine, a necessary factor if the full advantages are to be realized from high compression. A Buick design now undergoing tests is referred to as a Z-block engine, because of the zig-zag arrangement of cylinders in the two vees. In other words, the angle of the vee has been closed up appreciably and the cylinders staggered instead of being opposite one another.

The new engines are definitely not just around the corner. Months, possibly even years, of testing and probing and re-engineering will be required before they are ready for the road. Buick engineers have said privately they will have their design ready for 1950 models; technicians in other GM Divisions take this with a few grains of salt. For one thing, there is no assurance that the necessary high-octane fuels required by the high-compression engine will be available that soon. If not, an alternative might be the use of alcohol-water injection systems which can step up octane ratings of regular gasoline by as much as 25. Whatever the outcome, the Kettering engine, with its promise of a 40 per cent improvement in fuel economy, is on the way.

Briggs Marks Milestone

Briggs Mfg. Co. reached a milestone in its 38-year history recently with shipment of the 10,000,000th automobile body—a Packard convertible. When Walter O. Briggs founded the company in 1909 its business was painting and trimming wood bodies of that era and making touring car tops. No complete bodies were manufactured until 1919 when finished sedan and coupe bodies for Ford and Hudson-Essex were shipped from Detroit plants. The company claims it was the first to place body manufacturing on a mechanized conveyor basis, and has pioneered a number of welding methods, use of framing jigs and fixtures and other innovations now common.

Briggs developed a sample all-steel body for Packard more than 20 years ago and was quick to make the change from wood to steel in production units.

Uses 81 Die Castings

A total of 81 zinc die cast mechanical, structural and decorative components are used in the current Packard standard sedan, reflecting the wide usage the automotive industry has made of die castings. The Packard front-end assembly alone has 14 die castings in its makeup, including bottom grille crossbars, large central grille, hood ornament and ten smaller pieces, all weighing only 25 pounds.

What's Interesting About UNION CHAIN'S Supervision?

Union Chains for Every Application

Drive and Conveying Chains and Sprockets

- Bridge Chain
- Combination Malleable Iron and Steel Chain
- HB (hardened bearing) type chain
- BP (bar and pin) type chain

★

Finished Steel Roller Chains and Sprockets

- All manufacturer's standard, size ⅜ in. to 2½ in. pitch
- Single and Multiple Strands
- Extended Pitch Series in sizes 1¼ in. to 4 in. pitch

★

Silent Chain and Sprockets

- All sizes ⅜ in. to 1½ in. pitch

★

Flexible Couplings

- Roller chain type
- Silent chain type

Because dozens of precise operations go into the making of sprocket chain, trained and experienced supervisors are vital to the efficiency of each and the successful coordination of them all. At UNION CHAIN, where we make nothing but sprocket chain, attachments and sprockets for transmitting power and conveying materials, all our supervisors are specialists. We believe this concentration of supervisory skill in behalf of a single end product is interesting—and important—to our chain customers, present and future.

The Union Chain and Manufacturing Company

TRANSMIT POWER
UNION CHAINS
CONVEY MATERIALS

Sandusky, Ohio, U.S.A.

Republic 1947 Expansion Set At $33 Million

REPUBLIC Steel Corp., Cleveland, spent $32,925,275 during 1947 on capital expenditures for plants and properties, according to T. M. Girdler, chairman, and C. M. White, president, in the corporation's annual report.

Appropriations for this purpose since the end of World War II have amounted to $71,381,450. A total of $215,883,772 has been spent by Republic for capital expenditures for plants and properties since it was formed in 1930.

Pipe Mill Converted—A major expansion in 1947 was conversion of a plate mill to a hot strip mill in Youngstown to supply skelp for pipe lines and additional strip steel for tin plate. Pipe capacity there was also increased. In Warren, O., old coke ovens are being dismantled to be replaced by 80 new ovens. Stainless cold-rolled sheet and strip capacity is being doubled in Massillon, O. Cold-finished steel sheet capacity in Cleveland has been increased to above prewar level, as well as wire mill capacity in Chicago.

In Gadsden, Ala., a mill for the production of 20-in. to 30-in. pipe will be completed by the middle of 1948. Republic-built, government-owned wartime facilities are being acquired by purchase or lease. These are the blast furnace and sintering plant at Youngstown, the 61-oven coke battery and the sintering plant in Warren, and the blast furnace and coke oven battery in Gadsden. Top pressure blowing for blast furnaces, which increases production up to 20 per cent, is being installed on five furnaces in Youngstown, Buffalo, Warren and Chicago.

Coal Mine Leased—The Banning coal mine and adjoining acreages on the Youghiogheny river in Pennsylvania, with a present production of 750,000 tons per year, have been leased for a long term of years. Additional coal properties have been acquired at Beelick Knob and Jonben, W. Va., and Pikeville, Ky. Extensive exploratory work is being carried out at Republic's Chateaugay ore mine in northern New York which has uncovered substantial tonnages of high-grade iron ore that can be mined by the open pit method.

Republic has been expanding its research program and recently retained Arthur D. Little Inc., Cambridge, Mass. From this association the technique of blast furnace high pressure blowing has developed.

CINCINNATI-BICKFORD OFFICIALS: New officers of the Cincinnati-Bickford Tool Co., Cincinnati, are shown here discussing future plans for the company. Left to right are: L. Lee Schauer, vice president and chief engineer; Ozni E. Schauer, president and general manager; George P. Gradolf, chairman of the board and treasurer; Paul E. Heckel, secretary; Neil C. Schauer, vice president and sales manager

Lake City Malleable Buys Ashtabula, O., Foundry

Lake City Malleable Inc., Cleveland, has purchased a government-built malleable iron castings plant at Ashtabula, O., from War Assets Administration for $1,600,000.

Lake City has been operating the plant under lease since its construction early in 1944. Located on the eastern outskirts of Ashtabula, the site of the foundry includes slightly more than 55 acres. Buildings on the property are a foundry, material yard and supply building, service structure, boiler house and oil storage house. Peak production at the plant has been about 1400 tons of malleable iron per month.

Keystone Finances New Employee Pension Plan

Employees and management of Keystone Steel & Wire Co., Peoria, Ill., have approved a company-financed pension plan reflecting cost of living changes, according to Reuben E. Sommer, president and general manager.

Under terms of plan, effective Apr. 1, 1948, all Keystone employees are eligible for a pension based on a point system. This awards one point for each year of age and one point for each of service with the company. Employees 65 years of age with 85 points qualify. Any employee with 80 points, as well as those with disability seriously interfering with their work, may file a request with the executive committee of the company for retirement.

Monthly payments will be computed on a formula allowing .75 per cent of the first $3000 of average annual income during the 10 most productive years of the employee's service to the company, plus .60 per cent of his average annual income in excess of $3000 during that time. This is multiplied by the number of years of service, then divided by 12 to determine the monthly base figure.

Pensions will reflect cost of living changes by being reviewed semi-annually in conjunction with the Consumer Price Index.

Barium Steel Reports Backlog of $20 Million

Barium Steel Corp., New York, announces that its 18 operating subsidiaries have a combined backlog of orders on hand of approximately $20 million, according to the annual report of the company.

"Substantial progress," the report states, "has been made in paying off the current indebtedness of the corporation incurred in connection with the acquisition of a number of subsidiary companies."

Productive capacity of the rolling mills of the Barium subsidiary, Central Iron & Steel Co., Harrisburg, Pa., will be increased by at least 25 per cent as a result of improvements and new installations made last year. A number of other additions and improvements were made last year.

Consolidated net income of the corporation for the year ended Dec. 31, 1947, amounted to $1,689,213, an all-time high, compared to an income of $11,844 for 1946.

Briefs . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Markle Steel Co., Houston, Tex., steel distributor, has purchased from Ceco Steel Products Corp. its old plant site at 2814 Pease Rd. Purchase price for the property, which adjoins Markle's plant, was $55,000.

—o—

Plomb Tool Co., Los Angeles, manufacturer of hand tools, has completed a warehouse at its Jamestown, N. Y., plant which will stock its complete line.

—o—

Upson Co., Lockport, N. Y., manufacturer of laminated fibre wall and ceiling panels, has received a certificate of merit from Associated Industries of New York State Inc. for having established a 100 per cent safety record in 1947.

—o—

Landis Tool Co., Waynesboro, Pa., manufacturer of precision grinding machines, has named Moore-Handley Hardware Co., Inc., Birmingham, as its sales distributor in Alabama.

—o—

Electronic Associates Inc., engineering firm and manufacturer of electrical equipment, has moved to Long Branch, N. J.

—o—

Baldwin Locomotive Works, Philadelphia, is building six steam platen presses for the processing of plywood in the new plant of Compagnie Francaise DuGaban now under construction at Port Gentil, French Equatorial Africa. Delivery is scheduled late this year.

—o—

Department of the Navy has purchased two surplus marine turbine manufacturing plants for $9,023,561. One of the plants, at West Lynn, Mass., was operated during the war by General Electric Co. and the other, at Lester, Pa., by Westinghouse Electric Corp.

—o—

Avondale Marine Ways Inc., Westwego, La., announces that a $1,250,000 power barge was recently launched on the New Orleans river front. Built for Creole Petroleum Corp., the barge will be towed to Venezuela for use on Lake Maracaibo.

—o—

Stewart-Warner Corp., Chicago, has appointed Alemite Co., Billings, Mont., as a distributor for the products of its Instrument Division.

—o—

Bashlin Co., North Warren, O., has been purchased by G. G. Greene Jr. and associates. Firm manufactures valves.

—o—

Mathieson Alkali Works, New York, has voted to change its name to Mathieson Chemical Corp. as more descriptive of its diversified activities.

—o—

Automatic Transportation Co., Chicago, manufacturer of electric industrial trucks, has named the following sales agents: George E. Miller Co., Watertown, Mass., for Maine, New Hampshire and northeastern Massachusetts; Freeman Industrial Service Inc., Providence, R. I., for Rhode Island and southeastern Massachusetts; and G. Cass Lightner, Thetford, Vt., for Vermont.

—o—

Gulf Oil Corp., Pittsburgh, plans to market this spring an aerosol insecticide, using a light weight tin plate instead of a steel container.

—o—

Cutler-Hammer Inc., Milwaukee, manufacturer of electrical control apparatus, has moved its purchasing and patent departments to recently leased space at 1330 W. Clybourn St., Milwaukee. Area vacated at its main plant will be used for expanded sales and engineering activities.

—o—

Chicago Association of Commerce & Industry reports that industrial developments for the Chicago area, in the form of construction of new plants, expansions and purchases of land and buildings, amounted to $12,273,000 in March, compared to $13,089,000 for March, 1947.

—o—

Bureau of Mines has published a report describing how Japan's iron and steel industry, overtaxed by preparations for World War II, was able to increase its industrial output in wartime by producing considerable tonnages of sponge iron.

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American Standards Association, New York, reports that a seminar on industrial standardization will be given by Dr. John Gaillard June 21-25 at Engineering Societies Bldg., New York.

—o—

Westinghouse Electric Corp., Pittsburgh, has purchased a manufacturing plant near Irwin, Pa., from General Foods Corp. Property, which consists of four buildings providing 125,000 sq ft of floor area, will be occupied by the mica-processing section of the Westinghouse Transportation & Generator Division.

—o—

Consolidated Steel Corp., Los Angeles, is asking its stockholders for permission to change its name to Consolidated Western Steel Corp., to reflect the name of both Consolidated Steel and Western Pipe & Steel Co. which it acquired in 1945.

—o—

Delco Products Division, Dayton, O., General Motors Corp., has opened a sales office in the Terminal Tower, Cleveland, under the management of S. W. Blanton.

—o—

Colorado Fuel & Iron Corp., Denver, plans to start construction of a new rod mill this May which will increase its wire-drawing facilities by about 50 per cent. When fully equipped by March, 1949, company will have an annual output capacity of 200,000 tons of steel rods.

—o—

Hammer-Bray Co. Ltd., Oakland, Calif., maker of gas ranges and gas and oil heaters, has changed its name to Spark Stove Co. Inc. For many years the firm has sold its products under the trade name of Spark.

—o—

Rowe Radio Research Laboratory Co., engineering firm, Chicago, has formed Rowe Engineering Corp., under which name all new business will be transacted. Rowe Radio will continue to operate simultaneously, probably through 1948, until several government contracts are finished. Harry Charles Rowe is president and director of engineering in the new organization.

—o—

National Screw Machine Products Association, Cleveland, is offering two scholarships, each valued at $1500, for three-year co-operative courses in screw machine engineering at the Rochester Institute of Technology.

—o—

Vapofier Corp., Chicago, maker of gas producing units, has formed a division, Combustion Systems, to design, build and install complete combustion equipment for all industrial heating applications.

—o—

Unitcast Corp., Toledo, O., manufacturer of steel castings for railway and other uses, has organized Canadian Unitcast-Steel Ltd., in co-operation with Canadian associates. The subsidiary has purchased the steel casting foundry and business of Canadian Brake Shoe & Foundry Co. Ltd., Sherbrooke, Que. Company will make its headquarters in Sherbrooke and will operate the foundry.

The Business Trend

THIRD WEEK of the coal strike saw industrial production, as measured by STEEL's index, drop five points to 153 per cent (preliminary) of the 1936-1939 weekly average. In the week ended Apr. 3 most basic indicators of industrial activity were off to the year's lowest level.

STEEL—Ingot rate, which registered its sharpest decline this year during the Apr. 3 week, at 88.5 per cent of capacity was 9.5 points lower than its 1948 peak. Effects of losses in raw steel and pig iron tonnage will be felt for some time after the strike's settlement, despite the industry's success in avoiding drastic curtailments until coal stocks dwindled to critically low levels.

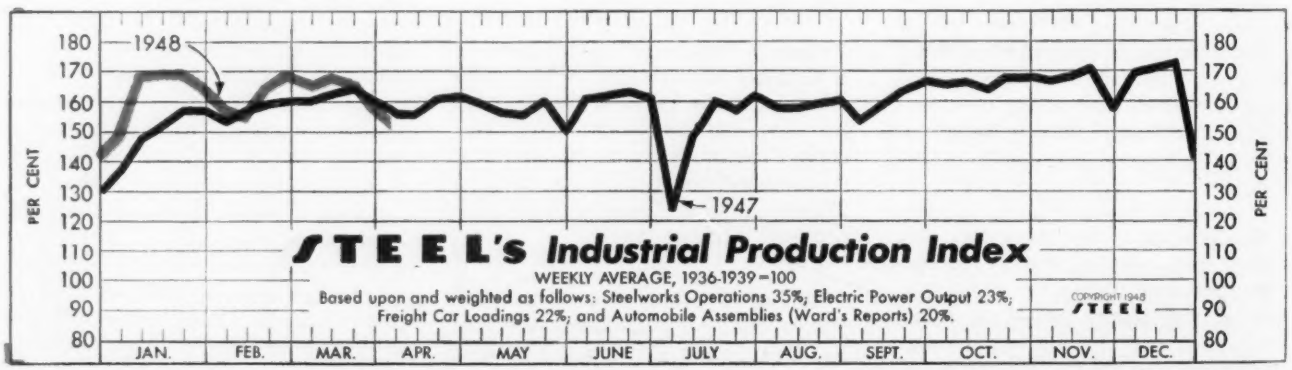
RAILROADS—Restricted use of coal-burning locomotives for freight and passenger service has been alleviated to some extent by lengthening trains and placing greater dependence upon diesels in important runs. These expedients, coupled with lower volume of shipments from plants whose operations were curtailed by the strike, enabled the roads to accept virtually all freight offered them. Prior to the strike 13 regional shippers advisory boards of the Association of American Railroads estimated freight car loadings in the current quarter would be 3.5 per cent higher than in the comparable period of 1947 when total loadings were 8,350,329 cars. Only the Central Western and the Trans-Missouri-Kansas districts expected decreases.

COAL—Production of bituminous coal in the week ended Mar. 27 dropped to 2,115,000 net tons, according to National Coal Association estimates. This was the lowest output since the miners' holiday last summer when production slumped to 1.9 million tons in the July 5 week.

ELECTRICITY—Although below the all-time peak of January when electric utilities produced 23,958,344,000 kwh of energy, February's production was the highest for that month on record, Federal Power Commission placing it at 22,193,720,000 kwh. This was 13.1 per cent higher than February, 1947, volume. For the year ended Feb. 29, 1948, output was 260.6 billion kwh, up 13.4 per cent from the year ended Feb. 28, 1947, and 1 per cent higher than the previous production record set in the year ended in January.

CONSTRUCTION—The largest volume of civil engineering construction since November, 1942, was reported in the week ended Apr. 1, at $218,784,000. The previous postwar high had been in the first week of December, 1947. March construction of this type totaled $508,096,000, according to *Engineering News Record*.

SALES—Value of daily sales by manufacturers was about 5 per cent higher in February than in January, although the latest month's aggregate was $500 million below January's $15.4 billion total, Department of Commerce estimates. Durable goods sales on a daily basis were up 6 per cent, with only automobiles and building materials not included in the general advance.



Index (chart above): Week ended Apr. 3 (preliminary) 153 Previous Week 158 Month Ago 166 Year Ago 156

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	88.5	93.0	94.5	97.0
Electric Power Distributed (million kilowatt hours)	5,037	5,065	5,293	4,693
Bituminous Coal Production (daily av.—1000 tons)	352	727	2,152	2,030
Petroleum Production (daily av.—1000 bbl.)	5,389	5,377	5,353	4,892
Construction Volume (ENR—Unit $1,000,000)	$218.8	$137.9	$183.9	$130.8
Automobile and Truck Output (Ward's—number units)	105,046	107,284	108,343	97,385

* Dates on request. † 1948 weekly capacity is 1,802,476 net tons. 1947 weekly capacity was 1,749,928 net tons.

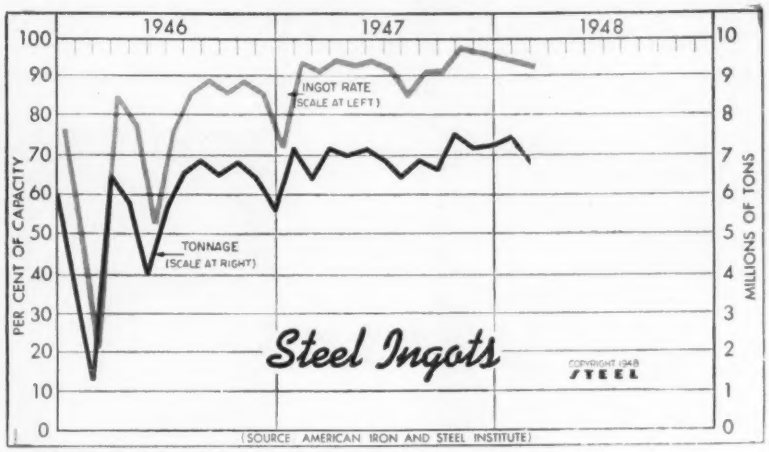
TRADE				
Freight Carloadings (unit—1000 cars)	645†	664	792	715
Business Failures (Dun & Bradstreet, number)	100†	101	113	71
Money in Circulation (in millions of dollars)‡	$27,780	$27,851	$28,024	$28,247
Department Store Sales (change from like wk. a yr. ago)‡	+17%	+9%	+4%	+10%

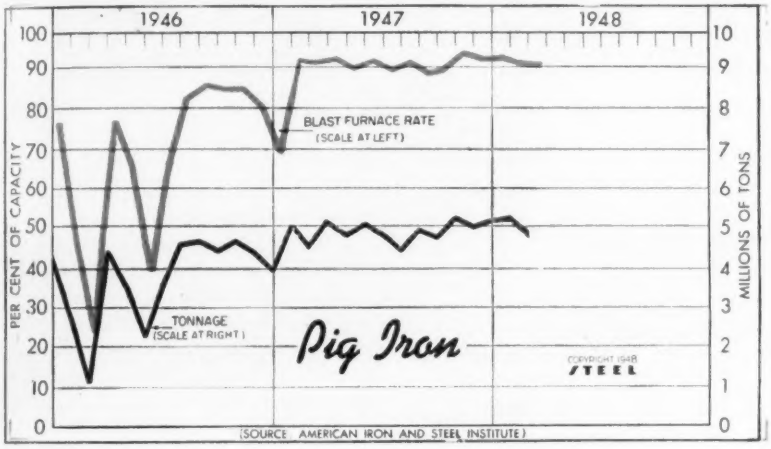
† Preliminary. ‡ Federal Reserve Board.

Steel Ingots

	Production (Net Tons—000)			Operating Rate (% of Capacity)		
	1948	1947	1946	1948	1947	1946
Jan.	*7,473	7,213	3,873	93.6	93.0	49.6
Feb.	6,941	6,422	1,393	93.0	91.7	19.8
Mar.	....	7,307	6,509	...	94.3	83.3
Apr.	....	7,043	5,861	...	93.8	77.5
May	....	7,329	4,073	...	94.5	52.2
June	....	6,969	5,626	...	92.8	74.4
July	....	6,570	6,619	...	84.9	84.9
Aug.	....	6,982	6,924	...	90.1	88.7
Sept.	....	6,789	6,556	...	90.6	86.9
Oct.	....	7,560	6,952	...	97.5	89.0
Nov.	....	7,233	6,458	...	96.3	85.4
Dec.	....	7,366	5,760	...	95.2	73.9
Total		84,784	66,603	Ave.	92.9	72.5

* Revised.





Pig Iron*

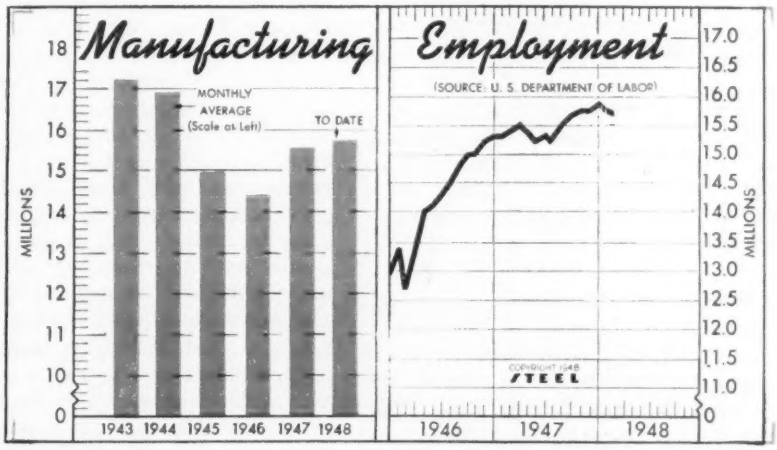
	Production (Net Tons—000)			Operating Rate (% of capacity)		
	1948	1947	1946	1948	1947	1946
Jan.	5,194	5,071	2,644	90.9	90.8	47.4
Feb.	4,838	4,550	1,148	90.6	90.3	22.2
Mar.	....	5,123	4,424	...	91.8	77.3
Apr.	....	4,830	3,614	...	89.3	65.2
May	....	5,081	2,274	...	91.0	39.8
June	....	4,810	3,682	...	89.0	66.5
July	....	4,585	4,705	...	90.3	82.4
Aug.	....	4,916	4,898	...	88.1	85.6
Sept.	....	4,801	4,687	...	89.0	84.8
Oct.	....	5,228	4,814	...	93.6	84.1
Nov.	....	5,015	4,435	...	92.8	80.0
Dec.	....	5,177	3,992	...	92.9	69.9
Total	....	59,210	45,318	Ave.	90.1	67.4

* Includes ferromanganese and spiegeleisen.

Factory Employment

(000 omitted)

	1948	1947	1946
January	15,852	15,372	13,499
February	15,741	15,475	12,751
March	.....	15,510	13,433
April	.....	15,429	14,045
May	.....	15,237	14,159
June	.....	15,327	14,371
July	.....	15,209	14,526
August	.....	15,593	14,876
September	.....	15,798	15,035
October	.....	15,831	15,064
November	.....	15,872	15,271
December	.....	15,965	15,348
Monthly Ave.	.....	15,552	14,365



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$12,925	$14,155	$14,451	$14,335
Federal Gross Debt (billions)	$253.1	$253.1	$254.2	$259.3
Bond Volume, NYSE (millions)	$22.6	$20.4	$18.6	$13.0
Stocks Sales, NYSE (thousands)	6,651	5,706	3,827	3,120
Loans and Investments (billions)†	$63.2	$63.8	$64.0	$63.5
United States Gov't. Obligations Held (millions)†	$35,469	$36,061	$36,281	$39,480

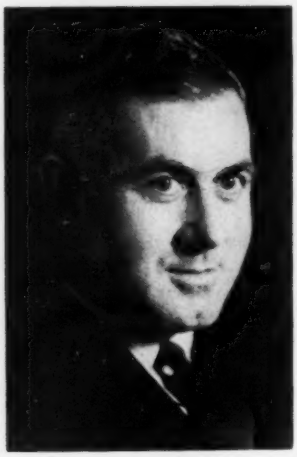
† Member banks, Federal Reserve System.

PRICES

STEEL's composite finished steel price average	$81.14	$81.14	$81.14	$69.82
All Commodities†	161.1	161.5	159.2	149.4
Industrial Raw Materials†	175.9	176.5	173.9	165.5
Manufactured Products†	155.9	156.3	153.5	143.3

† Bureau of Labor Statistics Index, 1926=100.

Men of Industry



F. L. LaQUE

H. H. ANDERSON

DR. M. S. AGRUSS

F. L. LaQue has been elected president of the National Association of Corrosion Engineers to succeed **G. B. Olson.** Mr. LaQue is in charge of the corrosion engineering section of the Development & Research Division, International Nickel Co. Inc., New York. Other newly elected officers of the association are: **H. H. Anderson,** vice president; **O. C. Mudd,** treasurer. Mr. Anderson is vice president and general manager of Shell Pipe Line Corp., Houston, Tex., and Mr. Mudd is chief corrosion engineer for the same corporation.

—o—

John L. Perkins III has been appointed vice president and general sales manager of B. F. Perkins & Son Inc., manufacturer of paper and textile finishing machinery, Holyoke, Mass.

—o—

William J. Hammond has been elected vice president of the Purdy Co. of Chicago. He formerly had been vice president in charge of railroad sales for Inland Steel Co., Chicago.

—o—

E. R. Godfrey, vice president, General Motors Corp., and general manager of the Frigidaire Division, has been appointed group executive in charge of the Dayton, O., and Household Appliance Divisions of the corporation. He will make his headquarters in Detroit. Mr. Godfrey will be succeeded as general manager of the Frigidaire Division by **Mason M. Roberts,** who is now factory manager of that division. **B. D. Kunkle,** vice president of General Motors, who is now group executive in charge of the Overseas, Canadian, Dayton and Household Appliance Division group, will continue as group executive of the overseas and Canadian operations, and in addition will have other special assignments.

—o—

Cleveland Graphite Bronze Co., Cleveland, announces advancement of each of the four men who founded the company in 1919 and have headed its management since: **Ben F. Hopkins,** president, becomes chairman of the board; **James L. Myers,** executive vice president, becomes president; **Carl W. Johnson,** vice president in charge of sales, becomes senior vice president; and **J. J. McIntyre,** senior vice president, becomes vice chairman of the board. Four other officers promoted are: **L. W. Christenson,** from sales manager to vice president and sales manager; **John W. Dixon,** from treasurer and controller to vice president and treasurer; **William G. Laffer,** from works manager to vice president and works manager; and **Newton D. Baker III,** from assistant secretary to secretary. Mr. Baker succeeds **Glen O. Smith,** of company counsel, who has been elected to the board of directors. **O. P. Gokay** has been appointed comptroller.

—o—

Jack A. Taylor has been appointed sales promotion manager of Perfect Circle Corp., Hagerstown, Ind. He has been associated with the firm for more than 15 years, and has served as a district manager and a regional manager. Since 1945 he has been handling special assignments in the Sales Division.

—o—

James R. Wilson has been appointed vice president of Mid-West Forging & Mfg. Co., Chicago. He was previously secretary and assistant treasurer, associated for the past 10 years with the company. He is succeeded in his recent position by **Ray T. Johnson Jr. Noble Gibson** has been appointed manager of sales, and **Gregory P. Baker,** superintendent of the Mid-West plant at Chicago Heights, Ill. Mr. Baker succeeds **N. J. Bardell,** who became vice president in charge of production.

—o—

Dr. M. S. Agruss has been appointed director of the research and development department of Precision Scientific Co. in Chicago. He previously had been a consultant in the field of petroleum technology and chemistry, and was also research supervisor with the Pure Oil Co. for 10 years.

—o—

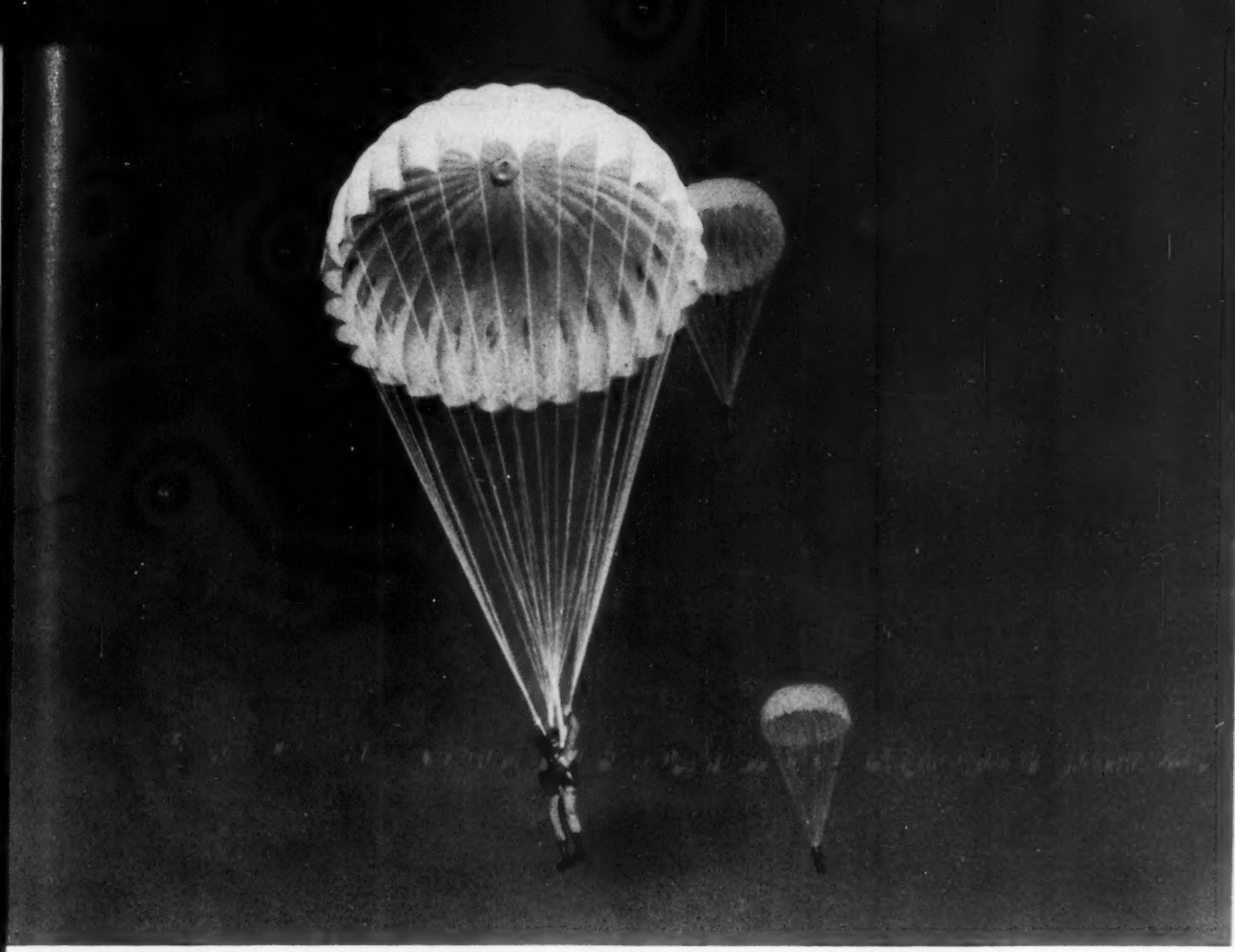
George P. Holman, for a number of years metallurgist and chief chemist at Detroit Steel Casting Co., Detroit, is now metallurgist with the engineering department of Chrysler Corp., Detroit, currently assigned to the Dodge Division forge plant.

—o—

F. J. Stokes, founder and president since 1895 of F. J. Stokes Machine Co., Philadelphia, has become chairman of the board. He is succeeded in the presidency by **Francis Dougherty Jr.,** who has been with the company in various executive positions since 1928, recently serving as secretary-treasurer.

—o—

The plant in Riverside, Calif., recently acquired by Revere Copper & Brass Inc., New York, for manufacture of Revere Ware, copper-clad stainless steel cooking utensils, will be operated by a new unit of the



There's a safe way to bring down metal working costs, too...

Plant after plant has found that costs *do* come down with Cimcool in the machines. This revolutionary new cutting fluid—this *chemical emulsion*—saves money three important ways:

1. LONGER TOOL LIFE (and therefore less down time) because of Cimcool's *chemical lubricity.*
2. FASTER SPEEDS are possible because Cimcool cools faster, through a unique physical change in the cutting fluid itself. Tools and chips actually stay cool to the touch.
3. CIMCOOL COSTS LESS than old-fashioned cutting fluids because it lasts longer. It isn't subject to rancidity. Its low surface tension and low adhesion to work and chips virtually eliminates carry off.

CIMCOOL DIVISION OF THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO, U. S. A.

CIMCOOL *for* 85%

Trade Mark Reg. U. S. Pat. Off.

OF ALL METAL WORKING JOBS

company, to be known as Riverside Mfg. Division. **J. M. Kennedy,** vice president of the Rome, N. Y., Mfg. Division and the Chicago Mfg. Division of the company, will be also in charge of the Riverside unit. He will continue to have headquarters in Rome. Transfer of personnel from the Rome Division to Riverside includes: **Edward T. Doyle,** superintendent at Rome, will be works manager at Riverside; **Edwin D. Howell,** chief chemist at Rome, will be assistant works manager; **Edward M. Allen,** assistant to the treasurer at Rome, will be treasurer; and **Marshall L. Land,** transferred from the industrial relations department at Rome, to be manager of industrial relations at Riverside.

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J. W. Rondel has been named merchandising manager of the Receiver Division at Electronics Park for General Electric Co., Schenectady, N. Y. He was formerly district manager of radio and electronic sales of General Electric Supply Corp., Houston, Tex.

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W. M. Myler, assistant treasurer, Rockwell Mfg. Co., Pittsburgh, has retired after serving the firm for 46 years.

—o—

W. P. Andrews, Edward Lehr and **James A. Perry** have joined the staff of Nottingham Steel Co., Cleveland. Mr. Andrews has been appointed assistant general sales manager. Mr. Lehr has been appointed assistant to **T. S. White,** vice president in charge of sales, and Mr. Perry has joined the sales staff.

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L. C. Watson, formerly with Trumbull Mfg. Co., Warren, O., has been appointed sales manager of distributor sales of the Allen-Bradley Co., Milwaukee.

—o—

John M. Floyd, vice president and a director of A. O. Smith Corp., Milwaukee, has been elected a director of the Bendix Aviation Corp., Baltimore.

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B. J. C. van der Hoeven has been appointed a vice president in the Chemical Division of Koppers Co. Inc., Pittsburgh. He has been assistant general manager of the division since last November, and will retain the duties of that office.

—o—

Henry M. Swartwood has been appointed director of advertising of Kaiser-Frazer Corp., Willow Run, Mich. Formerly a consultant on advertising and public relations with Kaiser Co., Mr. Swartwood will assume joint responsibility with the director of public relations and the sales promotion manager, for combined operations of the company's advertising, public relations and sales promotion departments at Willow Run.

—o—

Maxwell R. Warden has been elected a vice president of Remington Arms Co., Bridgeport, Conn.

—o—

Albert C. Uihlein has become associated with Mansaver Industries Inc., New Haven, Conn., as sales engineer. He formerly had been with the engineering department of American Steel & Wire Co., New Haven.

—o—

Nat Levy has resigned as vice president and secretary of Moore Dry Dock Co., San Francisco, after 42 years with the firm.

—o—

Fred W. Adams has been named advertising manager of Packard Motor Car Co., Detroit.

—o—

Link-Belt Co. announces that **C. C. Wiley** has been appointed district sales manager at Baltimore, succeeding **H. Merrill Bowman.** Mr. Wiley had been district sales manager at Birmingham, and is succeeded there by **James T. Bell,** formerly with the Atlanta office.

—o—

Frank W. Miller, Lehigh Structural Steel Co., Allentown, Pa., has been elected president of the American Hot Dip Galvanizers Association, an organization for the study of improved techniques and specifications in rust-proofing ferrous metal by the immersion of iron and steel in molten zinc.

—o—

Robert W. Kerr has been elected a vice president and director of Bingham-Herbrand Corp., Toledo, O., manufacturer of brake lever assemblies and drop forged products. He will be associated with the Herbrand Division of the organization at Fremont, O. Mr. Kerr had previously been executive vice president and sales manager of Plomb Tool Co. of Los Angeles.

—o—

Morse Chain Co., affiliate of Borg-Warner Corp., Chicago, announces appointment of **Henry R. Greenley** to the position of manager of the newly formed Morse-Formsprag sales department. He will retain his duties as manager for the present Morse coupling department.

—o—

H. M. Rishel, works manager, Indiana Harbor Works, American Steel Foundries, East Chicago, Ind., has resigned his position because of ill health. He has been succeeded by **R. T. Leisk,** formerly assistant works manager of the company's East St. Louis, Ill., Works. Mr. Rishel has been associated with the company 30 years.

—o—

William C. Appelby, assistant to the president of Southern Wheel Division, American Brake Shoe Co., New York, has retired after 42 years of service with the company. He served for nearly 23 years in various engineering and supervisory capacities in company plants in the South. He was transferred to New York in 1929, and assumed his recent position in 1944.

—o—

John D. Fenstermacher has retired temporarily from Columbia Steel Co., San Francisco, subsidiary of U. S. Steel Corp. At present he is closely connected with major new steel casting developments in the Far West. For the past 35 years, as a sales executive, Mr. Fenstermacher was associated with Columbia Steel Corp.

—o—

Oscar A. Ahlers has been elected

FRANK W. MILLER

JOHN D. FENSTERMACHER

JOHN S. SELTZER

Has joined Jack & Heintz Precision Industries Inc., Cleveland. Noted in STEEL, Mar. 29 issue, p. 64

JULIUS W. MARX

Who has been appointed chief engineer at Newcomb-Detroit Co., Detroit. Noted in STEEL, Mar. 29 issue, p. 69

CLAYTON R. BURT

President of Potter & Johnston Co., subsidiary, Niles-Bement-Pond Co., Pratt & Whitney Division. STEEL, Apr. 5 issue, p. 68

a vice president of Sheffield Corp., Dayton, O. He has been a member of the Sheffield organization for 23 years.

—o—

Glenn E. Johnston has joined Lukens Steel Co., Coatesville, Pa., as a member of its sales development staff. He will specialize in sales development work on Lukens Clad Steels among distributors and Lukens district sales offices. Previously he had been a special representative of the Composite Steel and Composite Tool Steels Divisions of Jessop Steel Co., Washington, Pa.

—o—

Foundry Equipment Co., Cleveland, has made the following additions and changes to its sales staff: **E. C. Troy** will serve as sales engineer in eastern Pennsylvania, New Jersey, Maryland and Delaware. He recently resigned as vice president of Dodge Steel Co., Philadelphia. He will also represent National Engineering Co. of Chicago in the above territory. **Fred W. Fuller** has been appointed sales engineer in northern Ohio, except the counties Williams, Fulton and Lucas, handled by **Messrs. M. A. Beltaire Jr.** and **W. W. Drissen.** Mr. Fuller also represents the National Engineering Co. of Chicago.

—o—

George W. Motherwell, vice president, Wyman-Gordon Co., Worcester, Mass., recently was elected president of the Magnesium Association to succeed **R. D. Taylor,** Federated Metals Division, American Smelting & Refining Co., New York. **D. W. Stewart Jr.,** president, Light Alloys Ltd., Renfrew, Ont., was named vice president, and **Don Warner,** sales manager, Aluminum & Magnesium Inc., Sandusky, O., treasurer of the association. **T. W. Atkins** was the re-appointed executive vice president and secretary. Five new directors were appointed to the association: **A. J. Peterson,** Apex Smelting Co., Chicago; **W. C. Murray,** Utica Radiator Corp., Utica, N. Y.; **C. C. Lomis,** New England Line Co., Adams, Mass.; and Mr. Motherwell and Mr. Warner.

—o—

John E. Meyer has been elected a director of Woodward Iron Co., Woodward, Ala. **J. H. Woodward II** has been elected a secretary. **D. T. Turnbull** has resigned as assistant secretary but will continue as assistant treasurer.

—o—

Sidney L. Chertok has been appointed to the newly created post of sales promotion manager of Solar Mfg. Corp. and its distributing subsidiary, Solar Capacitor Sales Corp., New York, in addition to his present duties of supervisor, advertising and technical service departments.

—o—

Robert J. Dodds has been appointed assistant traffic manager, and **Harry L. Aufderheid** has been named general traffic supervisor of Carnegie-Illinois Steel Corp., a U. S. Steel Corp. subsidiary, and of various other U. S. Steel subsidiaries in the Pittsburgh district.

OBITUARIES . . .

Joseph J. Strachan, general staff manager of sales, Carnegie-Illinois Steel Corp., subsidiary of U. S. Steel Corp., died suddenly Apr. 2. He joined the corporation in 1940 as assistant to the chief engineer of Carnegie-Illinois.

—o—

Harry R. Shick, 63, general manager, Jackson Iron & Steel Co., Jackson, O., died Mar. 27 after an illness of a few hours.

—o—

George Livingston, 64, founder and president of Livingston & Co. Inc., Philadelphia, died Mar. 29. Before establishing his own firm, he was associated for 37 years with E. J. McAleer & Co., Philadelphia, of which he was president when he went into business for himself in 1938.

—o—

Thomas E. Doyle, 85, president of Dravo-Doyle Co., Pittsbugh, from 1908 to 1925, died Apr. 1. Mr. Doyle became associated with Francis R. Dravo shortly after F. R. Dravo & Co. was organized in 1891. Dravo-Doyle was organized in 1901 and he became its president seven years later, a post he held until his retirement in 1925.

—o—

George R. Clayton, 62, former secretary-treasurer, Stamford Rolling Mills Co., Stamford, Conn., died Mar. 30. He resigned from active duty a year ago because of ill health.

—o—

Earl D. Rogge, 53, production manager for Meili-Blumberg Mfg. Co., Holstein, Wis., died Mar. 28, following a stroke.

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Hugo F. Urbauer, 79, chairman of the board, Midwest Piping & Supply Co., Inc., St. Louis, died Mar. 25 at Phoenix, Ariz.

—o—

Oscar A. Hoffmann, 71, secretary-treasurer of Biersach & Niedermeyer Co., Milwaukee, died Mar. 31 from injuries suffered in a recent automobile accident.

Why 75% of Large Detroit

Turret top completely formed with one stroke of Bliss enclosed toggle press after being removed from die.

Counsel on right press for job and prompt service are big factors

Over 100 Bliss presses of all types and sizes fabricate a diversified line of steel products in the Detroit plant of one of America's largest producers of automotive parts and home appliances. These presses range from the 40-ton Bliss inclinable press shown blanking parts for a home-appliance unit to the 1400-ton triple-action toggle press which forms the turret tops of low, medium and high priced cars.

Some of the ways Bliss presses are kept busy in this plant are shown in the accompanying photos...75% of the presses on its floors are Bliss-Built.

Two of a battery of 13 Bliss straight-side double-crank presses are shown forming pillars.

1400-ton triple-action enclosed toggle presses form turret tops. Press has four points of pressure on blankholder slide; is made of stress-relieved steel.

Engineering News . . . AT A GLANCE

ANGLE-POURS CRANKSHAFTS—Clever casting method is employed by Pacific Car & Foundry Co., Renton, Wash., in turning out high strength nickel-molybdenum iron crankshafts. It involves setting the mold horizontally and tilting it at a slight angle while pouring. The mold is mounted in specially designed trunnions, and is rotated through a 90-degree angle to the vertical position during cooling. Procedure is reported to be conducive to better feeding and improved directional solidification.

SLITS ELEVEN-GAGE PLATES—In Chicago, Universal Sheet & Strip Steel Co. slices plates up to and including 11-gage on an 84-inch slitter recently delivered by Paxson Machine Co. of Salem, O. The huge 20 foot, 16,000-pound unit, one of the largest built by the Salem company, is equipped with micrometer adjustments for setting slitter knives, and can be made to operate from 50 to 150 feet per minute. Compensation for deflection of the extremely long 6-inch rolls is made by an adjustable shoe that runs on a spacer above and below rolls.

GUNNERY "HAND-ME-DOWN"—"Brain" or control system incorporated in the 70-mile-per-hour tandem cold strip mill created by Mesta Machine for J & L Steel Corp. in Pittsburgh, is an improved version of the amplidyne used during the shooting war just passed to control gunnery systems of B-29s and battlewagons. System, in effect a small generator used as an accurate measuring and control device, maintains proper speed relationship between various mill motors, correcting automatically any irregularities that may occur while 5-mile long steel coils are rolled at high speed. Device, designed by General Electric engineers, also enables the mill to accelerate from 300 feet per minute to more than 4500 feet per minute in 6 seconds.

ADDS PRODUCTION VERSATILITY— Special multi-spot welder furnished Servel recently by Taylor-Winfield Corp., Warren, O., not only boosts processing of refrigerator doors to 200 per hour but it also enables the company to handle two different sizes with little disruption during changeover. Largest door measures 33⅝×46⅜-inches, and requires a 4⅛-inch draw. Subsequent operations, forming, trimming and two resistance welding operations are all done in a straight line. In joining hinge reinforcements to the side of the doors, a slide conveyor feeds components to the multi-spot welder which operates automatically as the door travels between its "legs". A segmental lower die in the unit enables the company to make a size changeover in about 1½ hours.

"ROBOT" COAL MINER—Plants stand to profit considerably through cheap fuel, if a "robot" miner that seems to loom as the "atomic" machine of the mining industry, lives up to expectations. The machine, a pilot model recently placed in action by its makers, Joy Mfg. Co., Pittsburgh, in a "secret" demonstration at Daisytown, Pa., combines three basic operations to speed up production of soft coal. Manned by one operator and a helper, it cuts, drills and loads coal in a continuous motion without resorting to explosives. Production capacity of the unit under sustained operation is still undetermined, but possibilities appear enormous considering the fact one of the company's loaders moves 8 tons of coal per minute.

RETAINS STAINLESS PROPERTIES—All corrosion-resistant properties of the parent metal are successfully retained by a technique evolved for welding stainless steel impellers at Buffalo Forge Co. Weld produced, it is reported, also provides corrosion-resistant properties matching that of the metal being joined. The method, furthermore prevents failure of the weld by controlling factors of distortion, keeping the latter to a minimum. In welding the hub to the backplate, for example, warpage is prevented by plug welding from the back. This prevents the concentration of heat at the center of the backplate. (p.82)

UNDERWATER GAGING — Waterproofing method used in connection with strain gages employed to determine stresses of propane storage tanks under service conditions was found to be 90 per cent effective. It involved the use of combination of petrosene A wax and no-void insulating compound B on the gages. Application was a laborious process but results justified the effort. To overcome humidity at the control board, a desiccant such as silica gel was used in the instruments. (p.86)

"REVERSED BROACHING"—Work is pushed through the tool in the broaching procedure employed to machine automotive window pinions in the new plant of Ternstedt Division, Fisher Body, Columbus, O. In addition high rate of production is achieved by the use of a rotating hopper that feeds blanks to the broach. Once the machine is set up it operates automatically, and requires only occasional attention to fill the hopper and inspect finished pieces. (p. 89)

LOW COST RUST PROOFING—Simplified room-temperature rustproofing process employed by Noblitt-Sparks Industries Inc., to treat outdoor metal furniture, integrates itself so well with manufacturing procedures that it is reported to involve a "per chair" cost for rust preventing material of less than 1/3 cent or, in terms of metal surface area, less than 17 cents per 1000 feet. In addition, the coating follows the profile or contour of the metal surface, whether smooth or rough, in an even film about 15 millionths of an inch thick. Its physical structure is likened to that of the high-polymer resins used in paint. (p. 90)

Arc Welding STAINLESS IMPELLERS

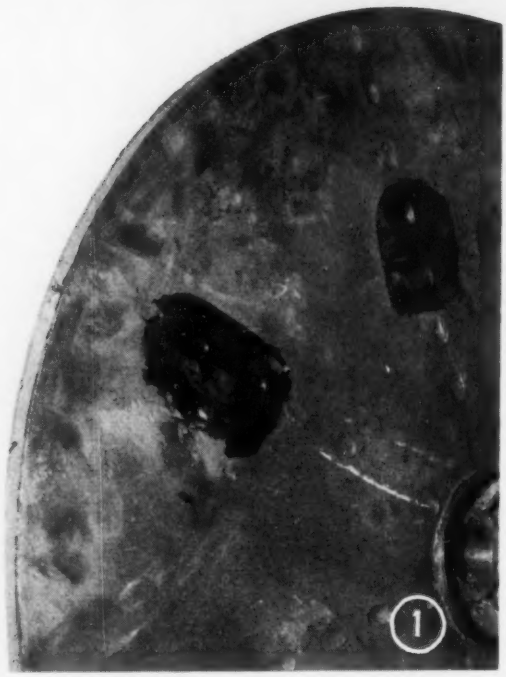


Fig. 1—Section of a typical plug-welded flange on an all-welded steel impeller

Technique described here appears to have succeeded in retaining all the corrosion-resistant properties of the parent metal, producing a weld with equal corrosion-resistant properties, at the same time preventing failure at the joint and keeping distortion to a minimum

INTRODUCTION of corrosion-resistant stainless steel for use in impellers required some modification in the welding procedure usually used on carbon steel due to the properties of the metal to be welded and to the requirements demanded for certain applications. Such impellers are called upon to handle hot gases and are particularly adapted for use with chemical vapors and fumes.

Mechanical strength is an important consideration in those units designed to operate at high peripheral speeds. In others corrosion resistance is all-important and mechanical strength is a secondary consideration.

Where an impeller is to handle corrosive gases or fumes it is essential not only that the parent metal but that the weld itself be unaffected by their presence. Alloys for this application are chromium-nickel steels and straight chromium steels, both of which may be alloyed with small percentages of titanium, columbium or molybdenum.

Both types display several properties in common which are of utmost importance as far as welding technique is concerned. In both chromium steels and chromium-nickel steels carbide precipitation occurs within the temperature range 800-1500° F. Between these temperatures carbon in the steel forms carbide with the chromium, thereby locally altering the crystalline structure. This change has been found to have a negligible effect on the strength of the alloy, but it has a very deleterious effect on the corrosion-resistant properties.

This local precipitation of carbides at elevated temperatures is of utmost importance to the welder. Stainless steels are much poorer conductors of heat than ordinary steel, so that in the welding process a localized temperature, much higher than that which would be obtained in carbon steel, would seem to be inevitable in the immediate vicinity of the weld due to the inability of the metal to dissipate the heat rapidly.

As a result, a zone would be heated up into the range where carbide precipitation occurs; this range would be maintained for an appreciable time and the corrosion-resistant properties of the metal thereby reduced.

Both straight chromium steels and chromium-nickel steels, particularly the latter, have coefficients of expansion greater than that of carbon steel. In the process of welding it would be expected that this characteristic would result in greater distortion of the plate and possible cracking of the weld.

The technique evolved for the welding of stainless steel impellers appears to have succeeded in retaining all the corrosion-resistant properties of the parent metal, producing a weld with equal corrosion-resistant properties, and at the same time preventing failure at the weld and keeping the distortion factor to a minimum.

Welding Technique—The principal concern in the welding of any impeller is the difficulty of preventing warpage. This is particularly true in the case of stainless steel impellers where high localized temperatures may occur. No particular difficulty was encountered in welding the hub to the backplate. This was accomplished by plug-welding from the back.

By this method, concentrated heat at the cen-

By WALTER L. ELLIOTT
Research Engineer
and
GEORGE HANDYSIDE
Plant Superintendent
Buffalo Forge Co.
Buffalo

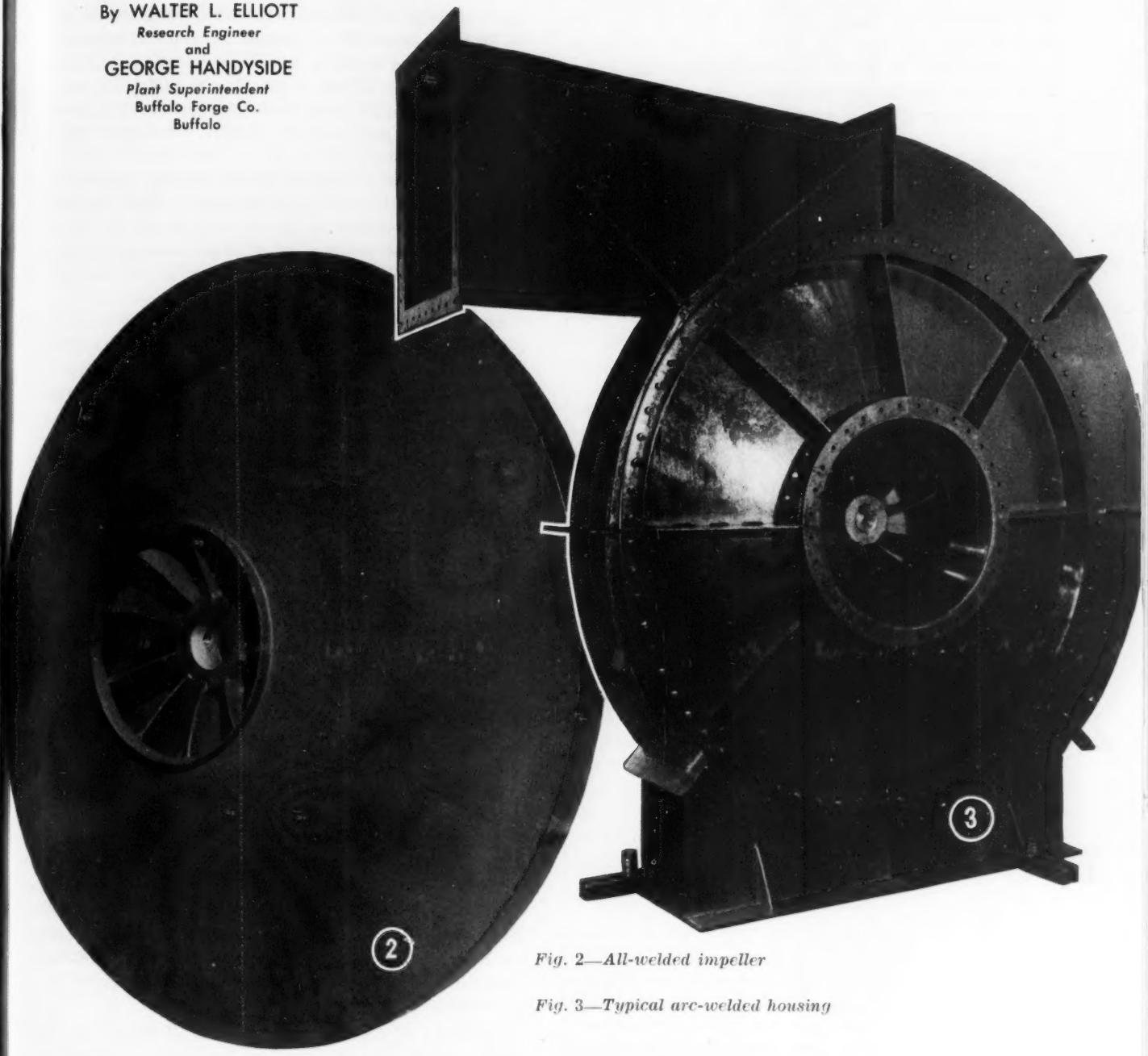


Fig. 2—All-welded impeller

Fig. 3—Typical arc-welded housing

ter of the backplate was avoided. A fillet weld cannot be used, as considerable distortion inevitably results and usually the work has to be discarded. With the hub welded in place, the work always was checked for runout or straightness.

A more serious problem was to evolve a satisfactory method of welding the blades to the backplate and flange. The backplate, with the hub welded in place, was clamped to a thick cast iron plate. This plate helped distribute the heat from the welds quickly, so that any point was retained within the critical temperature range for a minimum length of time.

The blades are stagger-welded onto the backplate in order to keep the temperature as even as possible. The weld is, of course, momentarily much hotter than the parent metal; consequently, it has to shrink to a greater extent.

A long continuous weld will often crack and hence the length of one section of weld is usually restricted to approximately 3 inches. Staggering is done by welding about 3 inches farther along on the other side.

If sufficient length of weld can be otherwise obtained, it is usual not to weld close to the hub and in this way to avoid concentrating heat close to the center of the backplate. Even in impellers designed for high rotative speeds it has been found unnecessary to have continuous welds performed on the blades.

Flange Welded to Blades—To weld the flange to the blades, the flange is centered on the blades and clamped in position for inspection. All blades may be checked for depth with the flange in position before welding and any high spots may be evened off. This avoids any danger of prestressing or "pulling" the flange during the process of welding. Blades are plug-welded to the flange from the outside. Usually

holes through the flange are $\frac{3}{8}$ x $\frac{3}{4}$-inch, that is, twice as long as wide. If round holes are preferred it is customary to make the diameter of the holes three times the flange thickness. From experience it has been found that rectangular holes are to be preferred.

In plug-welding the flange the weld is run completely around the periphery of the hole, but the center of the hole is not filled in with metal. One reason for this is that the center of the pool of metal will necessarily be at a high temperature and upon cooling may result in a crack. This crack may be invisible upon casual inspection but will inevitably show up if the impeller sees severe service. Another disadvantage of filling in the plug weld is that maintenance of a high temperature over a longer period of time inevitably causes carbide formation which should be avoided.

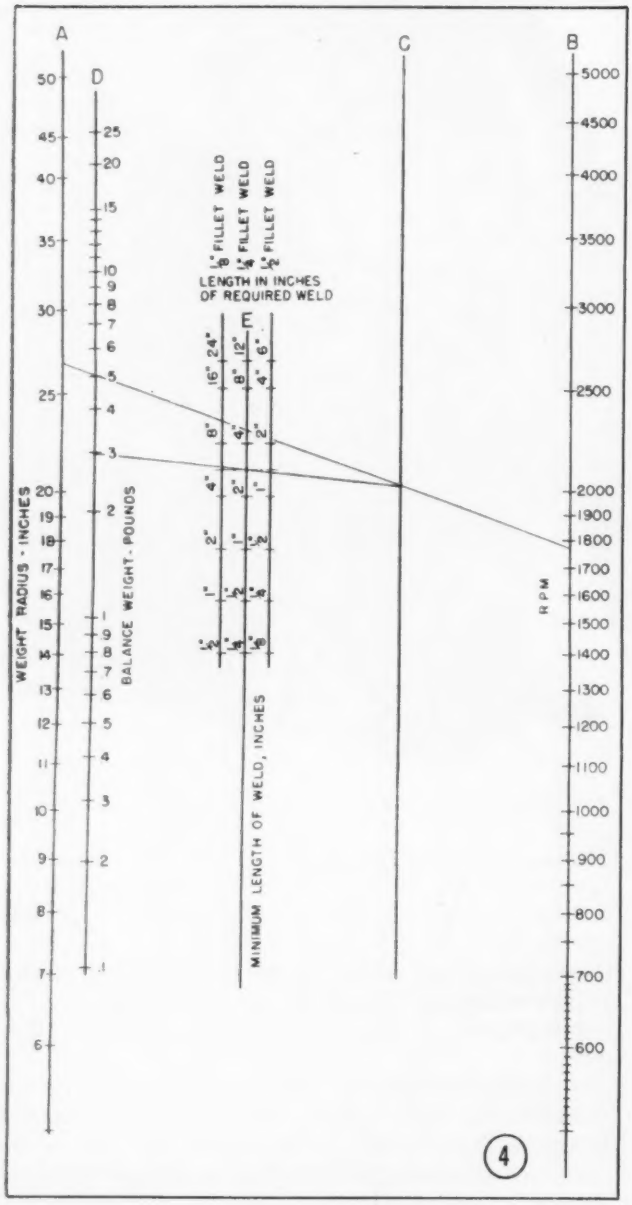


Fig. 4—Balance weight welding chart. Example: A balance weight of 3 pounds is required at 27-inch radius. Compute minimum length of ⅛-inch weld to be used for a speed of 1770 revolutions per minute. Draw a straight line from 27 inches on scale A to 1770 on scale B. Join point where this intersects scale C with 3 on scale D. Where this line crosses scale E read 2.9 inch length of ¼-inch weld and opposite this point read double this length or 5.8 inches of ⅛-inch weld

Fig. 1 shows a section of a typical plug-welded flange on an all-welded steel impeller. While a series of small depressions is left in the flange by use of this method of welding, this slight roughness is of no consequence as far as the over all efficiency is concerned.

Early welded impellers were constructed with the plug welds entirely filled in. The more recent method of leaving these slight depressions in the flange represents an improved technique and it has been found unnecessary to stress-relieve. Another primary advantage of this method is that no preheating of the work has been found necessary. This is of considerable importance.

Balancing — Every fabricated impeller must be given a static and a dynamic balance. In order to obtain perfect balance, small balance weights must be welded to the flange and backplate. As these are always applied near the periphery of the impeller, the location is accessible. It is therefore unnecessary to plug weld and fillet-welding is invariably employed.

Fig. 4 indicates a single method for determining the minimum length of weld for any balance weight. A greater length than that indicated by the chart may be used, but not less. It should be observed that the minimum length of fillet weld to be used varies inversely as the thickness, for example, the required length of ¼-inch weld is just half that of a ⅛-inch weld, so that the other thickness therefore may be interpolated.

Advantages of Arc-Welding—Arc welding of impellers has several obvious advantages. Fig. 2 shows an all-welded fabricated impeller. Welded construction allows closer clearances, and this in turn decreases the disk friction.

Diffusion of the gas into the scroll from the impeller should be radial in order to have a design of optimum efficiency. This optimum, which might be expected from welded construction with close clearances is not fully realized in practice. In order to avoid a scroll shape which would be expensive and unwieldy the outer periphery of the scroll is constructed much wider than the impeller tip width in order to allow diffusion in the axial as well as the radial direction.

While diffusion in a radial direction only is to be desired, very large scroll radii are inevitable, and from a practical standpoint some axial diffusion is to be preferred.

Fig. 3 is a typical illustration of an arc-welded housing in which some sacrifice in efficiency is made as a concession to practicality. Unfortunately this concession nullifies to some extent the gain in efficiency that would normally be expected with radial diffusion.

From a prize-winning paper, 1947 contest, James F. Lincoln Arc Welding Foundation.

Seen and Heard in the Machinery Field

By GUY HUBBARD
Machine Tool Editor

MOTORS AND GEARS JOIN FORCES: I have had occasion to comment recently on the results achieved in behalf of the railway industry when a big locomotive builder and a big electrical company combined their respective talents in the design and production of diesel-electric locomotives.

Now I have further convincing testimony in favor of similar "inter-industry" co-operation in the design and production of gearmotors in a wide range of sizes. In this case the co-operating companies are Reliance Electric & Mfg. Co., of Cleveland and Ashtabula, O., and Philadelphia Gear Works, Philadelphia.

What can be more sensible than two such masters of their respective crafts to combine their respective talents and facilities in the manufacture of power units in which the motor and the gear elements share equally in the responsibility for smooth performance?

There was a time when motor building was carried on more or less "by rule-of-thumb", with little or no thought to standardization and with little regard to the relationship between weight and bulk and horsepower. In those days gear making also was in many cases conducted by rule-of-thumb—even to the extent of using thumbs for involute templates.

Today the electrical industry has behind it such a system of pure science and higher mathematics, and the gear industry such a system of applied geometry, metallurgy and refined machine shop practice, that no one individual can hope to be a master in both fields.

When things reach that stage, the answer to problems involving both techniques lies in co-operation between highly trained and highly skilled specialists like those of Reliance and Philadelphia Gear.

SWORDS INTO PLOWSHARES: On a number of occasions I have had conversations with William K. Stamets, founder and president, William K. Stamets Co., regarding the great influence which machine tool dealer organizations such as his have had upon the history of the machine tool industry.

I am pleased to say that, with the collaboration of Anson A. MacLaren, Mr. Stamets finally has got down on paper something of the story of this influence as wielded by his own organization. While this book is entitled "Shells, Bombs and Machine Tools" and ostensibly is a history of contributions to essential production toward winning World War II, a tremendous amount can be read "between the lines" as to the industrial good which invariably is salvaged from any war effort into which America is pushed by force of circumstances beyond our control.

It is obvious from this book that, as a result of the wartime experience of the Stamets organization and many builders who worked with them, the techniques of pipe machining and threading, manufacture of pipe and tube fittings, multiple tool machining of heavy forgings gained impetus far beyond what would have been gained in normal times.

Americans always have been—and still are—much more enthusiastic about forging swords into plowshares than they are in forging plowshares into swords. However, when in the course of human events it has been necessary to turn America into an arsenal, the results have been a big surprise to some countries whose industries always were thinly veiled arsenals.

A TRUE BUSINESS STORY: There has just come to my desk another one of those annual reports which tells a really interesting story of the achievements of men and machines and which presents figures in a way which can be understood by anyone with reasonable intelligence. This one is by Monarch Machine Tool Co., Sidney, Ohio, whose moving spirit —W. E. Whipp—always did take pleasure in finding new and better ways of doing things.

In the first place, this report is addressed "to shareholders and employees". If I were working for Monarch, I certainly would feel kindly toward a management which "let me in on what is going on" in that way.

Another thing which has been done in this Monarch report is to superimpose the graph of the 1928-47 economic history of the machine tool industry as a whole upon the economic history of Monarch during those same years. Monarch's curve is considerably better than that of the industry as a whole. The conclusion to be drawn is that "natural forces" can be counteracted by progressive measures.

Still another innovation is the substitution of a unique "abacus" diagram for the familiar "pie chart" in showing what becomes of the gross "take" of the company. At the top of the abacus is a row of beads indicating that 35.77 per cent is paid to the employees. This is surpassed only by materials—42.29 per cent. Shareholders received 4.79 per cent.

As far as the workers are concerned, there certainly is no "pie in the sky by-and-by" which all too frequently is the interpretation resulting from contemplation of a segment of a pie chart.

CONVENTION BOUND: The human race has in it an instinctive urge to make a pilgrimage now and then. This trait crops out of the American business man in his love for conventions. As I write this, I am about to embark upon one myself — the 46th spring meeting of the National Machine Tool Builders' Association.

On the basis of 18 years of attendance at NMTBA meetings, I am convinced that great good comes out of them. The hoofs and horns with which one's imagination tends to decorate one's competitor fade into thin air when one gets to know him as a fellow craftsman rather than as a competitor—as is the case at these industrial get-togethers.

Strain Gage

...employed in studying propane tank str

STRESSES in a long horizontal storage tank containing liquid under pressure and subjected to the uncertain strains produced by two saddle supports placed symmetrically at varying distances from the heads, are now determined dependably by means of nondestructive tests using bonded resistance wire strain gages.

Usually, stresses in horizontal tanks can be determined satisfactorily by the ordinary beam theory when the heads are flat and the two supporting saddles are placed under the heads because the cylindrical portion holds its shape. If, however, the heads are convex spheroids and the supporting saddles are moved away from the heads, as many tank users prefer, tank stresses are affected in a complex manner. The shell tends to slump over saddle tips unless the shell thickness and the stiffening effect of the heads are sufficient to prevent it.

Because the problem becomes complex, tank shell strains at critical points and as many other points as practical were measured under conditions similar to those to be met in service. Baldwin SR-4 bonded resistance wire strain gages were used to measure these strains.

Tank on which tests of strain magnitudes were made has a capacity for 30,000 gallons, is approximately 62 feet long in the cylindrical portion and nearly 67 feet over the spheroidal ends. It is 9 feet in diameter and has a shell about 1 inch thick. Head thickness is 0.77-inch. Built and tested in the Chicago shop of Chicago Bridge and Iron Co., it was designed to store propane at 200 pounds per square inch pressure. The two supporting saddles are 12 inches wide and extend around a 120-degree arc of the shell. Saddles consist of 12-inch channels rolled to a 54-inch radius and braced to a flat base.

Stresses were determined with supporting saddles in four positions: At 1 foot, 5 feet, 9 feet, and 13 feet from seams joining the heads to the shell. Service loading was approximated by filling the tank with water and applying hydrostatic pressure. Strains were measured when the tank was empty, half full and full for each of the four positions. The tank was subjected to only 100 pounds per square inch hydrostatic pressure, one-half of the working pressure, because the stuffing tube leaked badly at this point. Readings were taken for this loading at the 5-foot, and 13-foot positions only. Test results showed, in general, that the tank can be supported safely on the two saddles described when set at any of the four positions.

Since the directions of the principal strains were unknown, rosette gages, delta type SR-4, were used. These were mounted back to back on inside and outside surfaces of the tank shell at 58 selected points, most of which are shown in Fig. 1. Not all of these were needed in every test and, since the test equipment could handle only 69 of the total of 116 rosettes, 34½ points were used in each test, for which 207 readings each were required.

Preparation Procedure—All of the gages were installed by the method outlined in the following six steps: 1. Areas about 12 inches in diameter were ground smooth. Horizontal and vertical scratch marks were made within these areas to locate gages.

2. Polished surface was cleaned with acetone and an area slightly larger than the gage was outlined with masking tape to keep the surrounding area clean and free of cement when applied.

3. Cement for Baldwin SR-4 gages was applied to both the steel surface and the back of the gage. Gage was pressed into place and held about 1 minute.

4. Cement was allowed to dry over night.

5. Gages were heated by infrared lamps at least 1 hour or until the resistance between the gage and shell was 200 megohms. Gages that did not meet this requirement were replaced.

6. Masking tape was removed. While the lamps were in place the gage and surrounding metal were painted with melted petrosene A wax. Wire leads were left bare.

Inside gages were installed first, and to simplify installation, the two halves of the tank were not welded together until after all of the inside gages and a few of the outside gages had been installed. Since tank strains were to be determined with a water load, the inside gages had to be further waterproofed. Steps taken in wiring and water-proofing, 7 to 9, occurred while opposite outside areas were heated by lamps for steps 5 and 6 on outside gages.

7. Lead wires of inside gages opposite the lamps were soldered to a 4-conductor cable and the cable was marked. Cables were connected to the control equipment with forked lugs.

8. Surface surrounding the wax was cleaned with carbon tetrachloride. A paper pocket 9 inches square was centered over each inside gage and attached on three edges by an adhesive cement leaving the top edge open.

9. Pocket was filled, while the plate was hot, with no-void insulating compound B.

10. Outside gages were then connected to control equipment by soldering connector wires to lead wires and by using forked lugs to connect to the switch boxes. The connecting wires were taped together in groups of four wires and marked.

11. Outside wire leads were painted with petrosene A wax. After the second test outside gages also were covered with a small mound of vaseline. The petrosene A wax was not sufficient protection for the leads and the gages when moisture condensed on the outside of the shell.

To compensate for temperature changes in the tank shell during tests, four delta rosettes similar to those

By L. P. ZICK and C. E. CARLSON
Research Department
Chicago Bridge & Iron Co.
Chicago

ge Technique

ne tan stresses under service conditions

used as stressed gages were used as dummy gages. Two of these were installed on unstressed steel plates 10 x 10 x ¼-inches in the same manner as the stressed gages on the outside of the tank. The two plates were hung on single bolts welded to the shell, as shown in Fig. 1. One of these, designated as Dummy I, was used as the dummy gage when readings were taken on the outside gages. The second was wired as an active gage and used to determine any drift in balance of the Wheatstone bridge circuit.

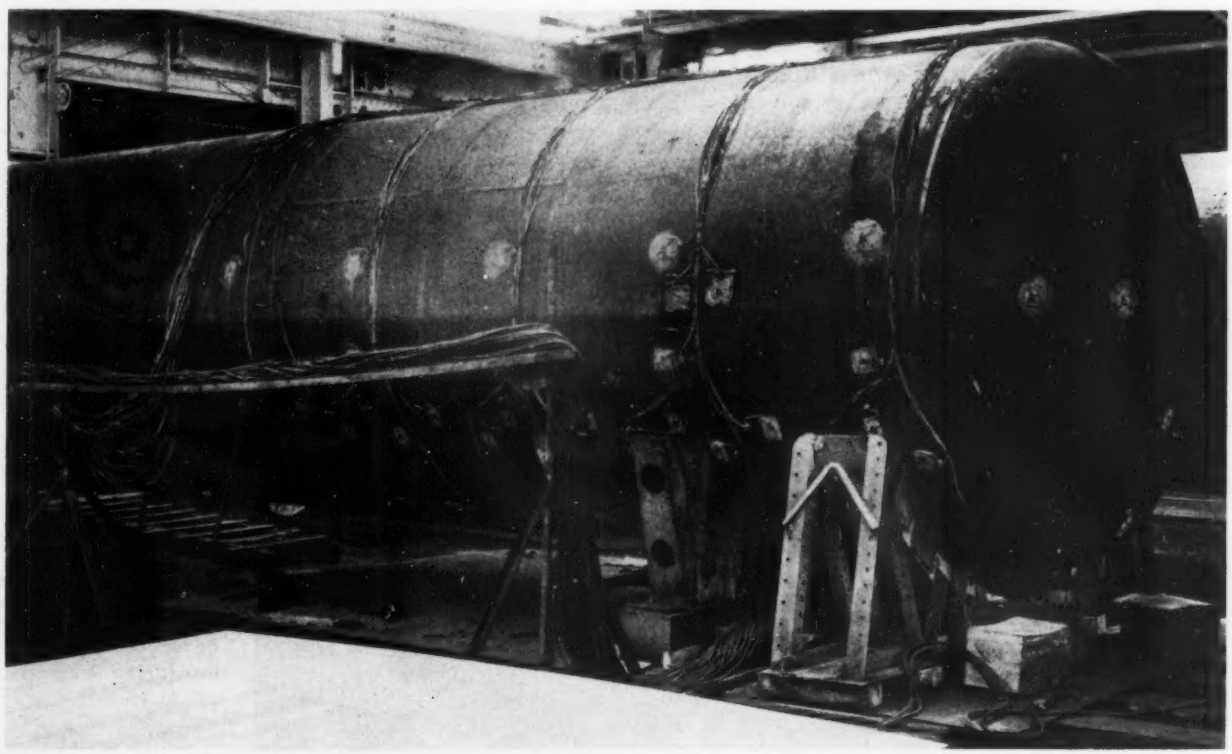
Other two dummy gages were installed on an unstressed steel plate 24 x 10 x ½-inches placed inside the tank and were installed in the same manner as the stressed gages on the inside of the tank. One of these, designated as Dummy II, was used as the dummy gage when readings were taken on the inside gages, and the other was wired as an active gage.

Simpler Water-Proofing Ineffective—An incidental objective of this strain gage survey of tank stresses was an attempt to simplify the water-proofing of the gages for protection either when gages are immersed in water or against high atmospheric humidity. Experiments were made with two other methods of covering six of the 58 inside gages. One of these points was covered with a mound of roofing cement because it was not convenient to apply a pocket around it. The other five points were covered like the other inside points except that petrosene A wax was poured in the pocket instead of insulating compound. The paper pockets were then removed and the wax and surrounding steel were covered with an adhesive cement. All six of these points gave erratic readings and had low resistance between the gage and shell at the end of the test.

Combination of petrosene A wax and no-void insulating compound B on the remaining 52 inside gages proved 90 per cent effective. Application was a laborious process but results justified the effort. During a 2½-week period of testing, only five gages indicated low resistance between the gage and the shell. Twelve days later when one test was rerun, three additional points indicated low resistance.

To prevent a change in dielectric around the wires inside the tank when the tank was filled with water, four-conductor jacketed cables were used instead of merely taping wires together as on the outside. In both cases No. 18 solid copper wires were used, and one wire was common to three gages. Although this cable held the readings on the inside gages steadier than any previous test, a problem was created at the stuffing tube. This 5-inch pipe assembly containing 60 cables was filled with insulating compound. The stuffing tube withstood 100 pounds per square inch, only one-half of the working pressure, apparently because the cable collapsed like a hose and pulled away

Fig. 1—A 30,000-gallon propane tank with 116 delta type Baldwin SR-4 strain gages mounted and wired to control equipment for determining the effect of variations in position of supporting saddles on stresses in tank shell and head



from the insulating compound. The elbow may also have allowed cavities to form when it was filled with insulating compound.

It has since been found that the problem of holding working pressure can be solved by using fewer cables, a straight pipe, and making the cable compact at one point at least within the pipe.

Conclusions—Most significant conclusion of the strain-gage survey was, of course, that this size tank can be supported safely on the two saddles described when set at any points up to 13 feet from the seams joining the heads to the shell.

Test stresses when saddles were at the heads agreed with the mathematical analysis by H. C. Boardman, director of research, Chicago Bridge & Iron Co., specifically with regard to shears above the saddle carrying over to the head and being transmitted back again to the saddle through the lower portion of the shell. However, an area of the shell above the saddle, as well as the area of the shell below the top of the saddle, was found to resist the shears transmitted from the head. Also the shears above the top of the saddle produced circumferential bending at the top of the saddle, and it seems logical that failure might occur at the critical load by bending over the horn of the saddle rather than by shearing on the head side of the saddle.

Critical point of the vessel full of water for each test location of the saddles occurred near the top ends of the saddle. Maximum tension stress was found there, resulting primarily from circumferential bending. The largest compression stress was there as a result of circumferential bending and ring compression. Maximum tangential shear stress was also found near the top of the saddle.

The longitudinal, or T_1 stresses, differed considerably from those given by the ordinary beam theory when the tank was full of water. Over the saddle the top and bottom regions were in compression and the equator region was in tension. The maximum T_1 tension occurred slightly below the equator. These measured values were 1330 pounds per square inch when saddles were at end seams and 2240 pounds per square inch when saddles were 9 feet from end seams, whereas the beam theory maximums at the upper fiber were 20 pounds per square inch and 300 pounds per square inch respectively. Bending moments were computed for several sections using the measured T_1 stresses and were of the same magnitude as those given by statics.

Longitudinal seam in the ring over the saddle should be above the equator, thereby preventing its being in the region above the saddle where maximum stresses occur. This also assures proper fit of the saddle.

In previous tests for failure of cylinders on saddle supports, when the distance between saddles was greater than the diameter of the cylinder, failure resulted from circumferential bending, the shell slumping over the horns of the saddle. Strain gage tests, showing the T_2 bending stresses at the top of the saddle to be the maximum stresses, gave similar indications.

It was noted that the pressure stresses did not add directly to the high fiber stresses on account of circumferential bending. Instead, the compression fiber took more than its share and the tension fiber took less. Tangential shear stresses were distributed almost identically under full water load and with full load plus 100 pounds per square inch pressure.

In all four positions of the saddles, the stresses in a half full tank were found to be less than the stresses in a full tank.

Until further tests are made, the following conclusions may be used only as guides when extending them to tanks in general. It appeared that the head exerted some influence in holding the shell cylindrical until the total vertical shear on either side of the saddle is nearly equal. Also the head influence seemed to equalize the maximum shear stress on either side of the top of the saddle in tests with saddles at 5 feet and 9 feet from the end seams.

In connection with test procedure, it was found that with careful work the water-proofing method outlined in this article should give at least 90 per cent efficiency for the gages under water. Since high humidity caused difficulty at the control board, the use of a dessicant such as silica gel in the instruments was suggested under these conditions.

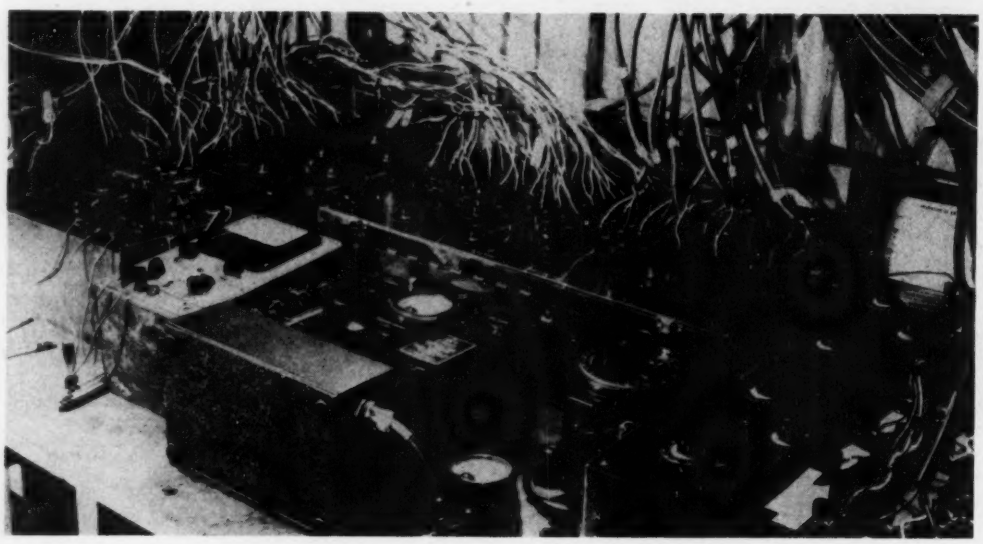


Fig. 2—Control equipment includes three switching boxes which surround the Baldwin strain indicator unit, voltmeter and Variac voltage regulator. A voltage stabilizer, converter, and megohmeter, used to check resistances, are not shown. Indicator and switching boxes complete the measuring bridge circuit

Automatic Broaching

. . . speeds output of auto window pinions by pushing work through tool

By HERBERT CHASE

FOR rapidity in production combined with high precision it would be hard to match the setup for manufacturing small steel pinions for automobile window regulators at the new plant of Ternstedt Division of Fisher Body, Columbus, O. Gears are cut from blanks of ¾-inch outside diameter produced with hub and chamfered hole in a screw machine which finishes all surfaces except those of six teeth which have a 0.204-inch face.

Blanks are ½-inch thick and include a hub 0.190-inch long and 11/32-inch outside diameter. Hole diameter is 7/32-inch. At opposite end is a boss or stepped diameter of 17/32-inch outside diameter which is serrated or cut with teeth lacking full depth to provide a fastening to a mating part.

Pinions previously used were produced by stamping but sheared teeth had an inferior finish and could not be held with limits as close as are possible in producing teeth on a broach. Latter method removes all metal between teeth and produces teeth having a fine finish and high degree of precision.

As shown in Fig. 1, duplicate broaching machines with identical equipment are used for the process. Due to an unusual method of feeding blanks to broach, high rate of production is attained and labor cost for broaching is very small. Each broaching machine is fitted with a rotating hopper into which blanks are deposited in bulk. This type of hopper is employed to feed blanks into a magazine down which they slide and drop through a gate. Operated automatically as ram ends its upward stroke, gate is synchronized with machine.

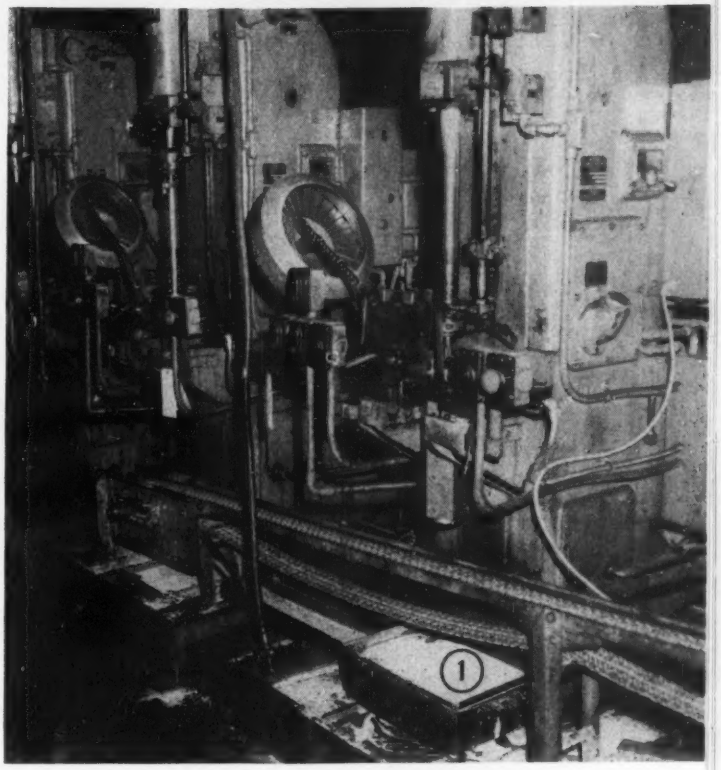


Fig. 1—Broaching machines that produce teeth on turned pinion blanks fed from rotating hoppers into magazine

After blank reaches broaching position, ram forces it through broach completing the cycle. Once machines are set up they operate automatically and require only occasional attention to fill the hopper and inspect finished pieces.

Broaches themeselves are tubular when assembled, Fig. 3, but are made in halves each of which has three sets of teeth. Outside surfaces of broach tube form the faces of a hexagon. Tube is split in an axial plane through sides of the hexagon section.

In this unusual setup, tubular broach remains fixed to bed of machine and blanks themselves are forced through by ram which produces one pinion in each down stroke. At end of stroke pinion falls from bottom of broach and drops onto a chain belt that carries pinions to a portable hopper bin.

Fig. 2—Six-tooth steel pinion made from a blank previously produced in screw machine. Teeth are cut in a single pass through tubular broach

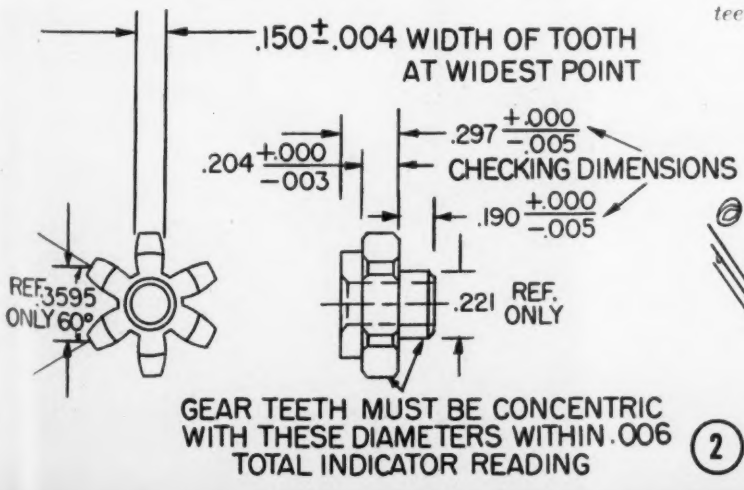
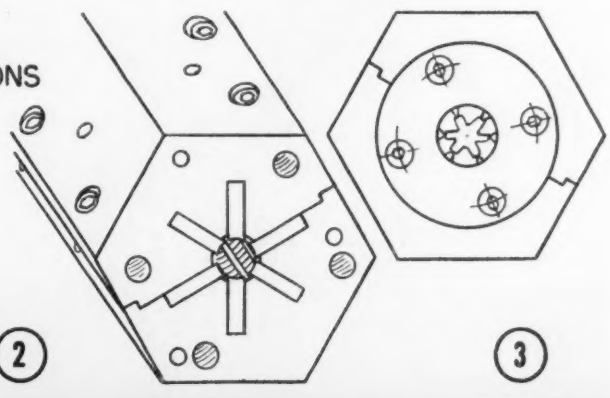
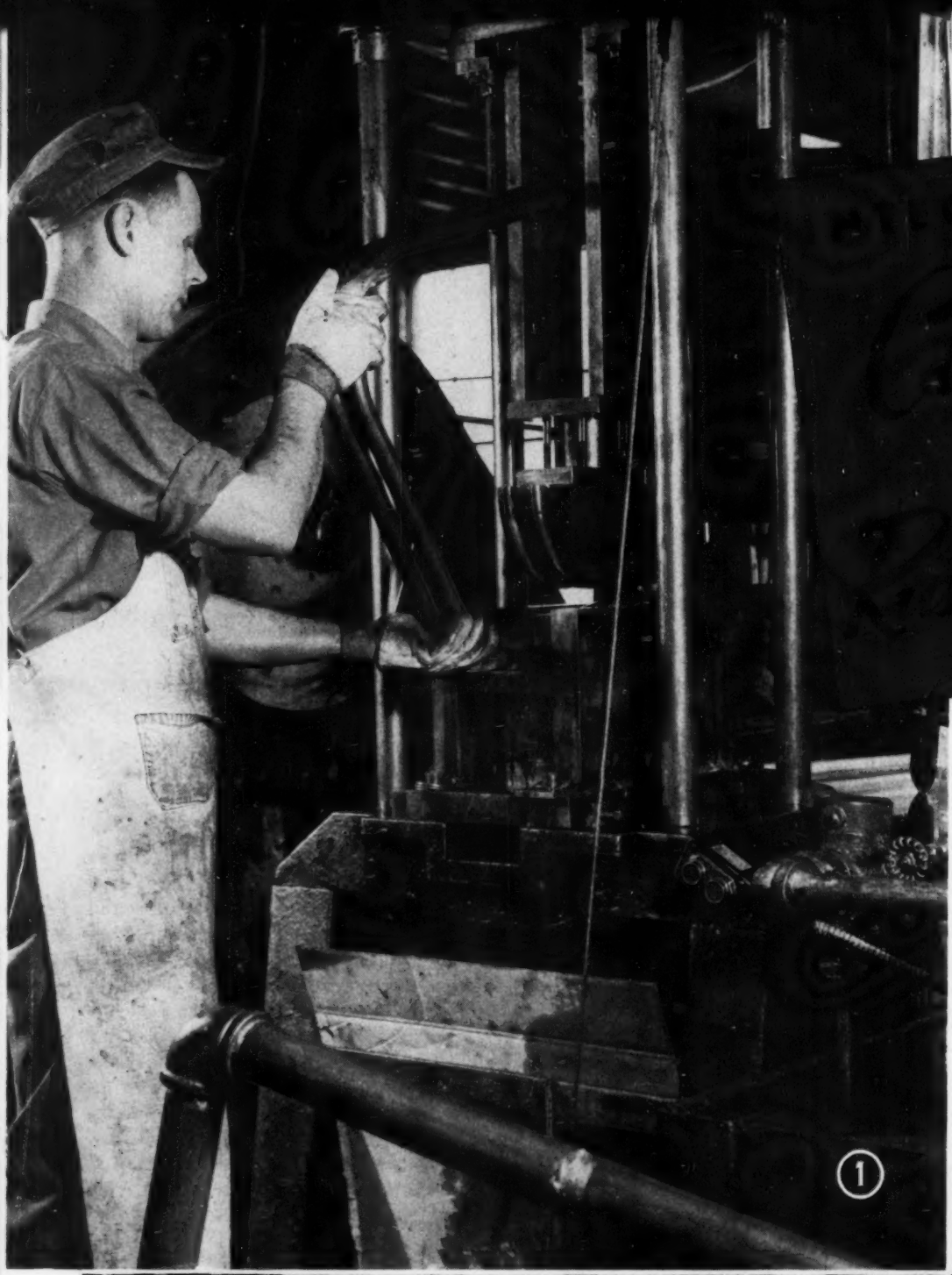
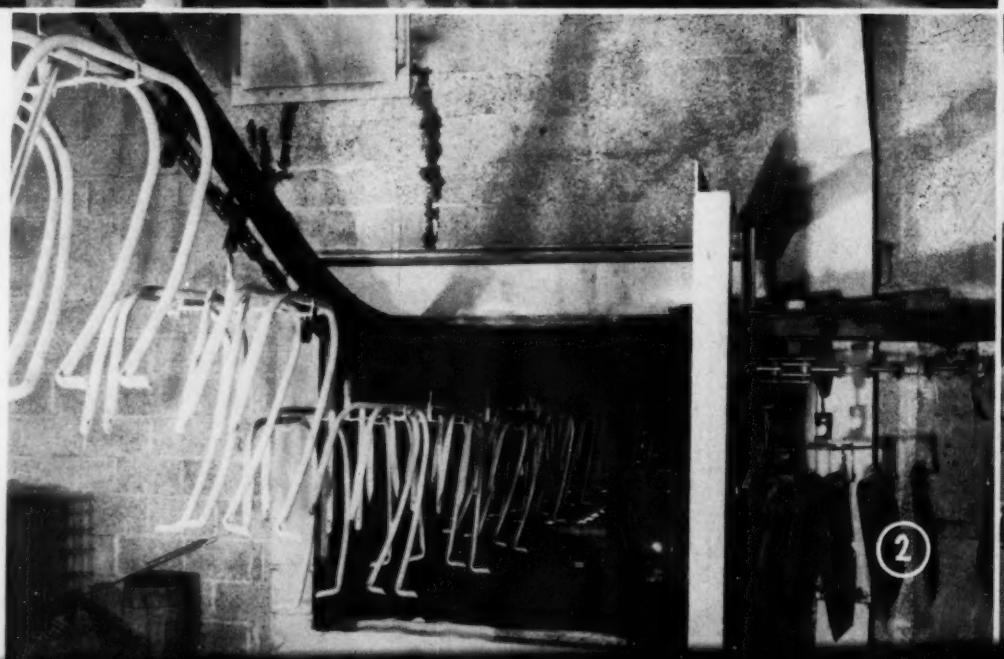

.150±.004 WIDTH OF TOOTH AT WIDEST POINT
.204 +.000 −.003
.297 +.000 −.005
CHECKING DIMENSIONS
.190 +.000 −.005
.221 REF. ONLY
REF. 3595 ONLY 60°
GEAR TEETH MUST BE CONCENTRIC WITH THESE DIAMETERS WITHIN .006 TOTAL INDICATOR READING
2

Fig. 3—Tubular broach holder which is made in two sections that have a hexagonal external shape when assembled. Six sets of broaching teeth cut pinion teeth when blank is forced through assembled broach





. . . process lowers costs, makes possible manufacturing innovations and improvements in outdoor metal furniture plant



METAL outdoor furniture is rust-proofed and prepared for paint finishing by a simplified room-temperature process co-ordinated with other manufacturing steps at the Columbus, Ind., plant of Noblitt-Sparks Industries Inc. The integrated method is said to involve a "per chair" cost for rust-proofing material of less than 1/3-cent. When converted to metal surface area this figure becomes less than $0.17 per 1000 square feet.

Rust-proofing chemical was developed by Calgon Inc., Pittsburgh. According to company engineers, coating that results when the new material, called Banox, is applied, (either by spray or immersion methods) is an amorphous or noncrystalline phosphate. Physical structure of the film is reported to be similar to that of the high-polymer resins used in paint. Coating follows the profile or contour of the metal surface, whether smooth or rough, in an even film approximately 15 millionths of an inch thick.

With cleaning and rust-profing processes a part of the production line, Noblitt-Sparks' plant is set up to produce large volumes of parts without manual handling. From the time components leave the presses to their arrival at packaging stations they are suspended on overhead conveyors.

First principal step in production of the Arvin line of metal furniture is the fabrication of tubing for frames. Hot-rolled pickled 16-gage steel strip is formed into cylindrical shape on progressive forming rolls of a tube mill, and the seams joined by continuous electric resistance welding wheel. A roller-type cutter at the mill's end cuts the tubing in the desired lengths for either rocker-type, straight chairs, cocktail tables or other items of the line.

Tubing then is formed into the specified frame shapes on a series of machines, first of which is a hydraulic tube bender equipped with rocker dies. When a frame leaves this department it has been completely formed—its joining ends stab-cut, necked and annealed and bolt holes punched. It then goes onto a rack on the overhead monorail conveyor that henceforth moves it through all succeeding steps—cleaning, rust-proofing with Banox solution, rinsing, drying, painting, baking—to final inspection and packaging with other parts for shipment.

An interesting innovation of the frame line is in the initial operation—that of tube-forming. Because the steel strip arrives in the plant with a coating of oil, and this film may be trapped inside the tubing and later cause trouble by dripping into the paint vats, a detergent cleaning operation has been incorporated in the tube mill at the point where the flat strip is fed into the forming rolls.

Sheet steel chair backs and seats are blanked, pressed, punched and flanged on a series of presses linked by roller conveyors and gravity chutes. Production on these two lines is synchronized so that a chair seat arrives at the first chain conveyor station at the same time as a chair back. These pieces are suspended alternately on the conveyor racks, and the movement of this conveyor is co-ordinated with that of the conveyor transporting the tubular steel frames, from this point on through the various operations leading up to final inspection and packaging.

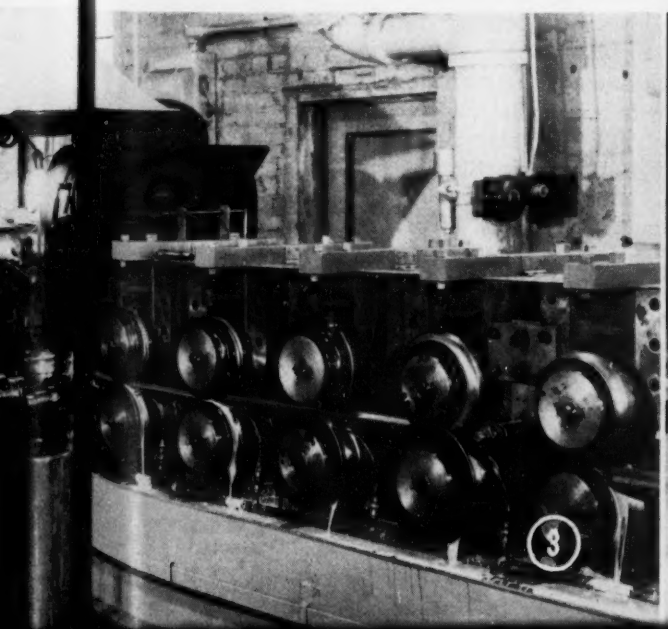
Each of the two series of chain conveyors is nearly ¼-mile long—the frame conveyor 1462 feet, with 548 racks spaced 40 inches apart; seat and back conveyor, 1372 feet, with 514 racks 32 inches apart. The former travels at an average speed of about 18

Fig. 1—Tubing is formed into furniture frames on hydraulic tube bender equipped with rocker dies

Fig. 2—Conveyor-borne furniture parts, travelling different courses from the enclosed paint room, are reunited as they enter the baking oven where they will be "slow-toasted" for 25 minutes at 340° F

Fig. 3—As flat strip enters tube mill from right, a detergent solution removes oil film to prevent later trouble in paint tanks. Rolls progressively form strip into tubing, which is joined at the seams by continuous electric resistance welding wheel shown at left beneath ventilating hood

Fig. 4—Workers in packaging line give finished parts a last inspection as they apply decal labels and insert parts in protective paper covers



feet per minute; the latter, about 15½ feet per minute. Speed of various operations and of the conveyor systems is co-ordinated to maintain a production rate of approximately 600 units per hour.

Thus teamed together as they leave the fabricating department—the furniture frames on the top conveyor at this point and the seats and backs travelling below them, "double-deck" style—the parts then are conveyed into the first operation in the double-deck U-shaped wash tunnel. First comes cleaning with an alkaline spray at 140° F. This is followed by a cold water rinse, and then by spraying from sides, top and bottom with a 1 per cent solution of rust-proofing chemical at room temperature. A second cold water rinse is next, and finally a chromic acid rinse at approximately 150° F.

Conveyors turn, next, from the end of the wash tunnel into the drying oven. When the furniture parts emerge from drying they are ready for the paint tanks. Frames go into white synthetic dipping enamel in a stationary tank; backs and seats into red or green in movable tanks mounted on wheels for interchangeability.

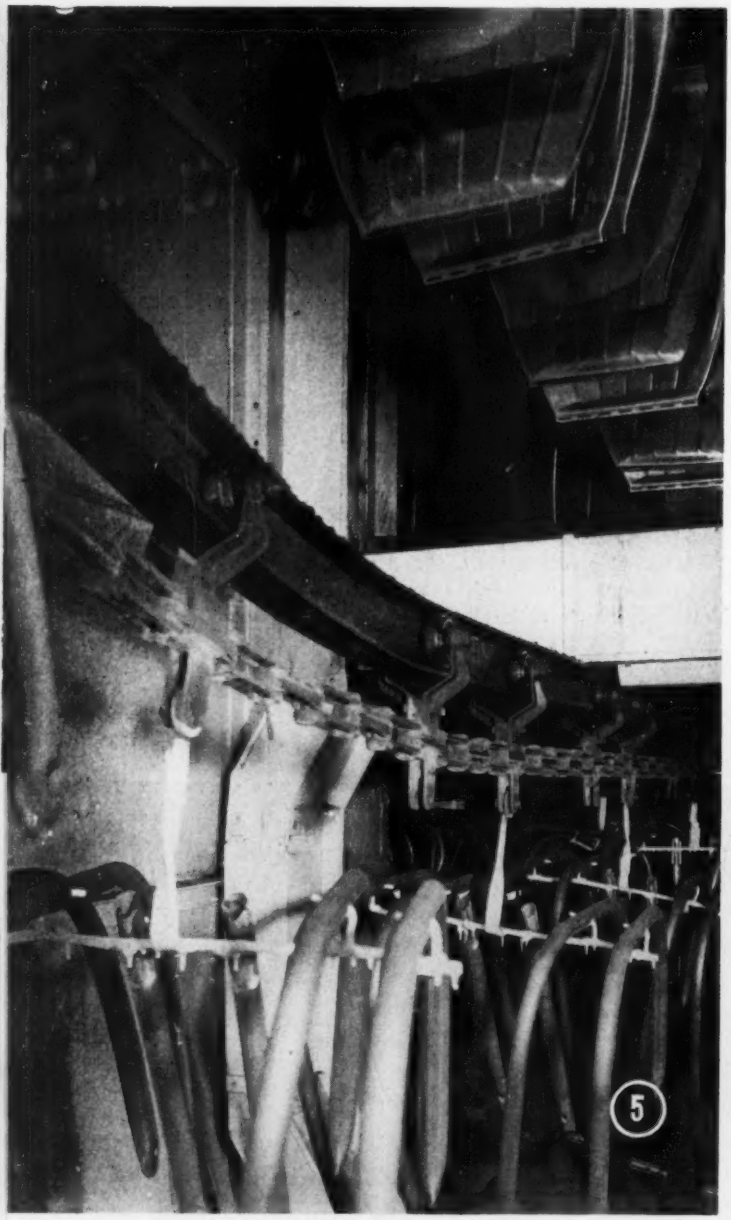


Fig. 5—Two conveyor lines emerge from drying oven bearing metal furniture parts, which are now clean, rust-proofed and ready for painting

Tank tracks are made of aluminum to reduce the hazard of sparks in this atmosphere. This department also is equipped with a forced air ventilation system and automatic sprinkler heads.

An interesting method of controlling paint viscosity in the tanks is employed here. Ducts built onto the tank sides enable workers to circulate cooling water in hot weather, steam in cold, to regulate the paint temperature.

As the furniture parts rise out of the tanks, and for some distance beyond, drain boards catch the excess paint as it falls and return it to the tanks. Drip boards underlie the conveyor lines as they swing towards and up to the baking ovens. Conveyors move the parts side by side through the infrared, gas-fired baking ovens.

Next and final steps are inspection, labelling, wrapping—frames in paper sleeves, other parts in paper bags—and packaging in fiberboard cartons which move down a roller conveyor equipped with a trough arrangement that sets them right side up to facilitate final handling before loading and shipment.

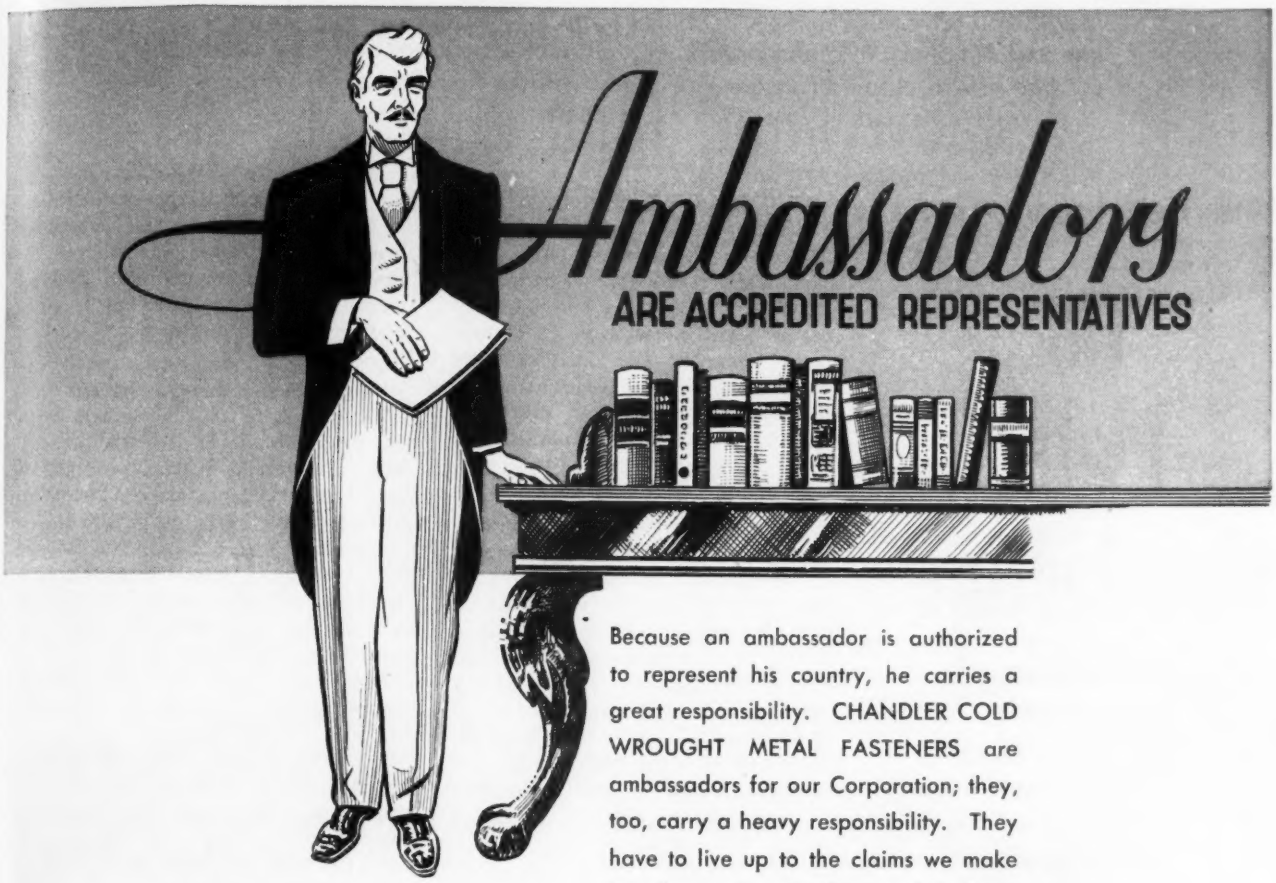
All the washing tunnel operations are of the spray type. The alkaline cleaner requires 1 minute; water rinse, 1 minute; spray with 1 per cent Banox solution, 1 minute; water rinse, 30 seconds; hot chromic acid rinse, 30 seconds. Next operation, drying, requires 6½-minutes; cooling on conveyor, 7½-minutes. After painting, 8½-minutes are allowed for draining off before parts arrive at the bake oven. Baking in the gas-fired oven is for 25 minutes at 340° F. Time for cooling on the conveyor following baking is approximately 26 minutes.

Wider Use of Supersonic Testing Seen

Wider use of supersonic testing in steel is expected since in some cases tests can be performed under conditions in which no other test is applicable said R. H. Webster, research engineer, Jones & Laughlin Steel Corp., Pittsburgh, at a recent meeting of American Instruments Society in Pittsburgh. Since method is applicable to detection of defects such as pipe, blowholes, porosity, deep crack, and laminations in wrought and cast steel, this technique has made possible nondestructive testing of large sections such as blooms, rolls, and die blocks.

Steel mill applications of the "thru" or "shadow" methods are still in the experimental stage, Webster stated, with the most promise being offered in continuous inspection of strip for laminations and bimetal sheet for bonding. Users of heavy equipment, such as railroads and steel mills, are finding these methods to be invaluable in preventive maintenance where the primary aim is the detection of fatigue cracking before complete failure occurs.

Successful use of these tests will require exercise of good judgment, well seasoned with experience, concerning the product and the test and augmented by careful planning and thorough preliminary test work, Webster cautioned.



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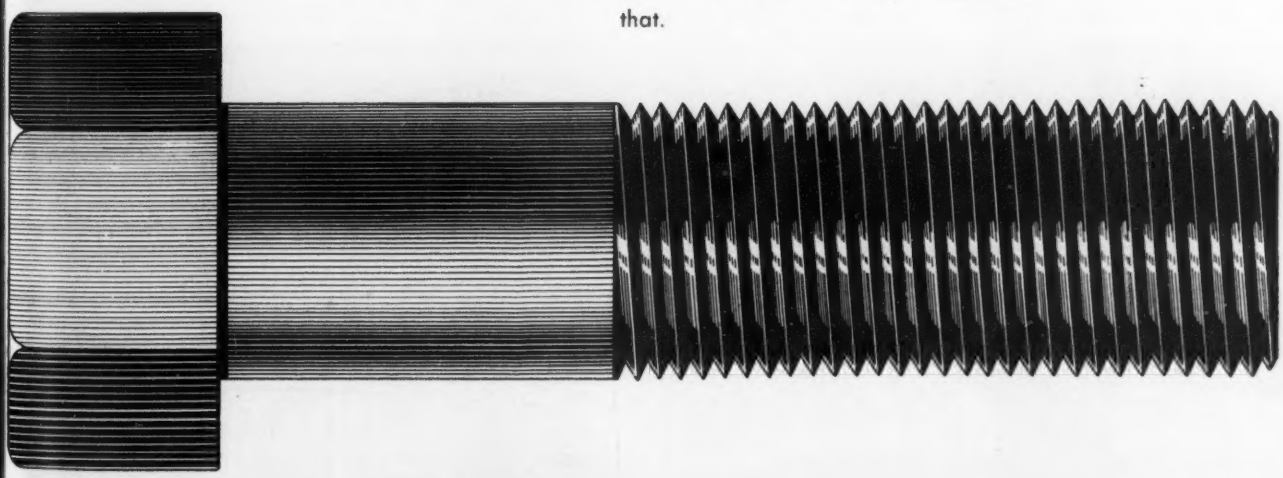


CHANDLER PRODUCTS CORP.
1491 CHARDON RD. CLEVELAND 17, OHIO

Installation of feeders and picklers at tin stacks and development of assorting and bundling lines eliminate heavy manual labor jobs, improve product and afford output of larger size plates without heavy losses from damage. Method of operation at Southern tinhouse is described

New Developments in Tin Plate Manufacture

By E. F. HARRIS

Ass't to General Supt.
Tennessee Coal, Iron and Railroad Co.
Fairfield, Ala.

HUNDREDS of sizes of tin plate are manufactured in four or five different thicknesses ranging from 0.0080 and 0.0120-inch, and in four or five different hardness and ductility specifications, as well as in certain coating weights. This must be if the canmaker is to be in position to produce the many sizes and shapes of cans which are found on store shelves today.

In the past 15 years there has been considerable improvement in manufacturing processes for tin plate from the open-hearth to sheared plates. From the white pickler to finished tin plate, there has been no radical change or improvement during the same period until recently. During 1941 the tin mill organization of Tennessee Coal, Iron and Railroad Co., Fairfield, Ala., began searching for some means of improving hot-dip tin plate and at the same time a means of eliminating the remaining heavy manual labor jobs inherent in the manufacture of tin plate, such as white pickling, tin machine feeding, and reckoning of plate.

Search was first for a means of providing a feeder and pickler immediately ahead of and in tandem with the tin machine. In the new process, lifts of sheared plate weighing as much as 10,000 pounds are delivered directly from the flying shears to the entry end of the tin stacks. These lifts are pushed onto hydraulic hoists, automatically operated and fitted with a roller top for positioning, and are raised to proper position for feeding by the vacuum cup feeder, usually a 2-pass feeder; each side of the feeder working from a separate lift of plate. The plates are fed two abreast into an electrolytic pickling unit consisting of a rubber-lined tank equipped with two conductor roll assemblies; the top roll of steel or carbon is paired with a bottom roll of rubber,

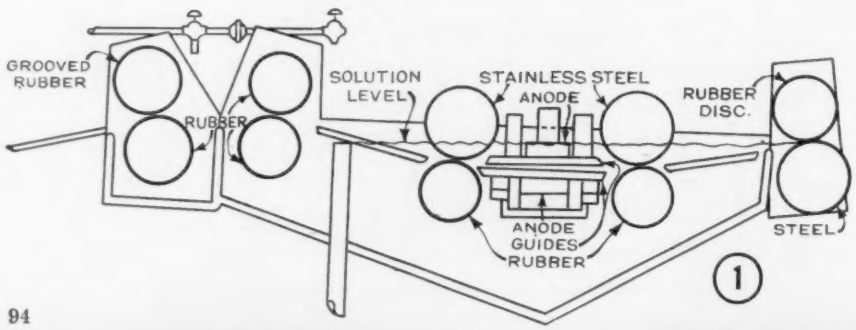
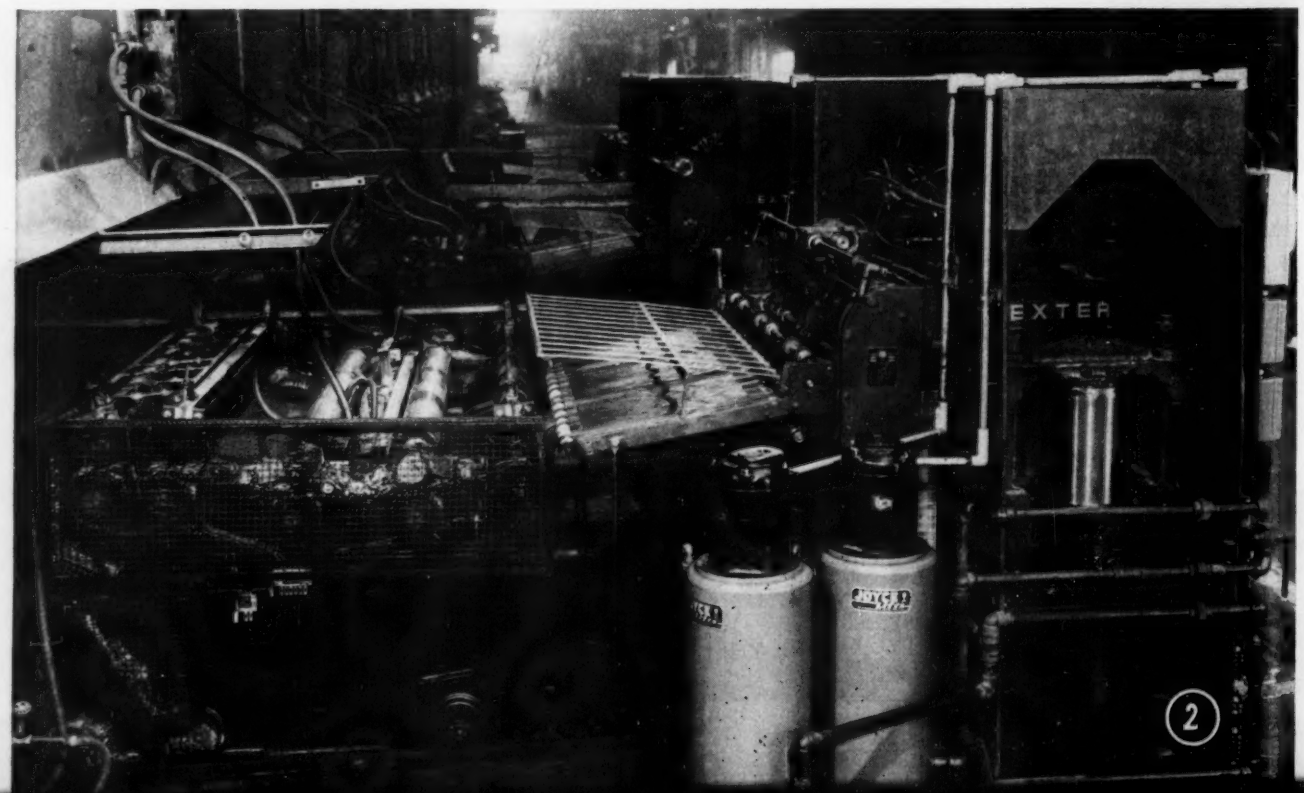


Fig. 1—Arrangement of pickle tank, rolls, guides, anodes and solution level

Fig. 2—Side view of feeder and pickling unit



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ENGINEERED TO YOUR EXPECTATIONS

*REG. U.S. PAT. OFF

WHY BUNDYWELD IS BETTER TUBING

1 Bundyweld Tubing, made by a patented process, is entirely different from any other tubing. It starts as a single strip of basic metal, coated with a bonding metal.

2 This strip is continuously rolled twice laterally into tubular form. Walls of uniform thickness and concentricity are assured by close-tolerance, cold-rolled strip.

3 Next, a heating process fuses bonding metal to basic metal. Cooled, the double walls have become a strong, ductile tube, free from scale, held to close dimensions.

4 Bundyweld comes in standard sizes, up to 5/8" O.D., in steel (copper or tin coated), Monel or nickel. Call or write Bundy for tubing of other sizes or metals.

BUNDY TUBING DISTRIBUTORS AND REPRESENTATIVES:

Peirson-Deakins Co., 823-824 Chattanooga Bank Bldg., Chattanooga 2, Tenn.
Lapham-Hickey Co., 3333 W. 47th Place, Chicago 32, Ill.
Rutan & Co., 404 Architects Bldg., Philadelphia 3, Pa.
Pacific Metals Co., Ltd., 3100 19th St., San Francisco 10, Calif.
Eagle Metals Co., 3628 E. Marginal Way, Seattle 4, Wash.
Alloy Metal Sales, Ltd., 861 Bay St., Toronto 5, Canada

Bundyweld nickel and Monel tubing is sold by International Nickel Company distributors in all principal cities.

with glass micarta finger guides set between the conductor rolls.

This automatic feeding and electrolytic pickling of sheets at the tin stacks eliminates the former white pickling operation as a process in the manufacture of tin plate. A further advantage is derived by the installation of this vacuum feeder electrolytic pickling unit in that now larger size sheets can be tinned.

After successful completion of the first task, elimination of white pickling, a search was made for means by which tin plate could be assorted (or inspected), counted, weighed and packaged in a continuous line in tandem with the tin machine and thus avoid manual and tractor handling of the finished product. A line was evolved and, after changes and improvements, is now in succesful operation and is satisfactorily accomplishing the job of assorting, counting (reckoning), and weighing hot dip tin plate continuously from the tin machines.

Sheets of tin plate emerge two abreast from the discharge end of the tin machine, and each sheet has a list edge, or heavy layer of tin on the bottom end of the sheet as it emerges from the tinning rolls. In order to inspect and later pile the sheets evenly, it is necessary to transfer both sheets to a common conveyor and at the same time to reverse the list edge on approximately 50 per cent of the sheets.

The pilers were removed from the discharge end of the tinning line and replaced on one side by a short conveyor and on the other side by a long conveyor, and an electromagnetic sheet lifter and turn-around was placed between these conveyors with one arm over each conveyor. As the sheets emerge from the tin machine, the sheet coming out onto the short conveyor is lifted by the turn-around, and turned through 180 degrees and deposited between sheets emerging onto the long conveyor. The magnetic turn-around in a single movement transfers the sheets to a common conveyor and reverses the list edge on the required number of sheets. From this operation, the sheets from both passes of the tin machine are now in a single line on a common conveyor for delivery to the inspection conveyor and wheel.

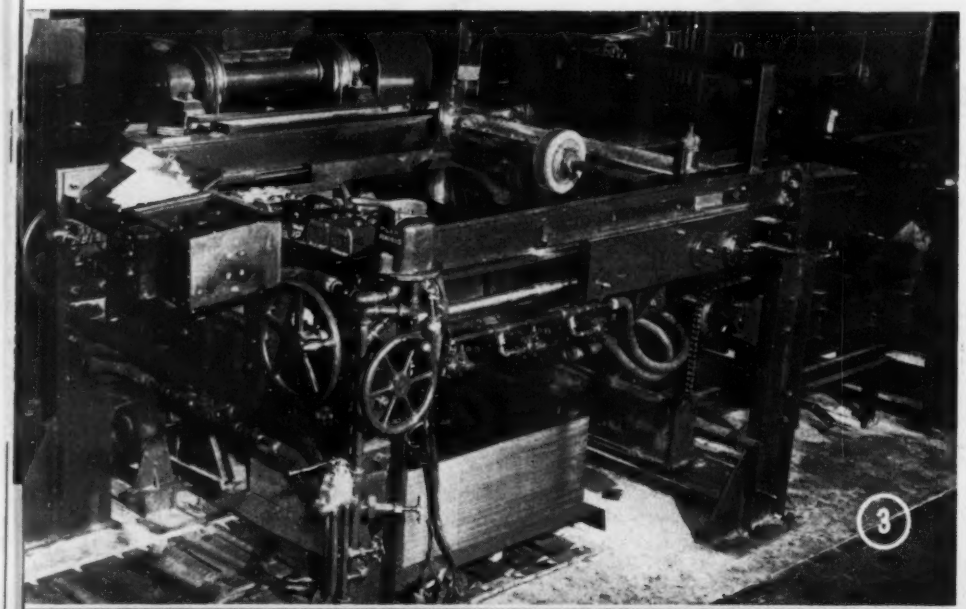
The inspection wheel is essentially a hub, or shaft, driven by a magnetic clutch, and to the hub are attached six sets of spokes. Each set of spokes, consisting of four spokes set in line along the axis of the hub; these are spaced to allow passage of four belts comprising an inspection conveyor which crosses the inspection wheel. The six sets of spokes are spaced evenly around the periphery of the hub.

In operation, the lead sheet coming into the inspection wheel deflects a trip switch located near the hub of the wheel, to actuate a relay closing the circuit on the magnet clutch, which is normally rotating. The energized magnet on the clutch attracts and holds a steel disk which drives the inspection wheel. One complete revolution of the clutch moves the hub through an angular movement of 60 degrees, sufficient to advance one set of spokes one position.

One surface of a sheet is inspected as it comes into the inspection wheel. The inspector checks weight and stiffness of sheet, and at the same time inspects the other surface of the sheet, finally classifying the product to its proper category—primes, menders, or "waste waste," while it is in number three position on the wheel. The line is equipped with three pilers—prime piler, mender piler, and waste waste piler. The flap gates to off-grade pilers are operated from push buttons at the control station located at the inspection wheel.

A double mechanical counter is used to count the sheets coming in the prime piler, and the switches operating the counters are placed in the conveyor at the entry to the prime piler. The assorting and bundling line is approximately 74 feet long from the discharge end of the tinning line to the discharge end of the packaging conveyor, and in this length the hot dipped tinned sheets from a tin stack are inspected, classified, counted, piled, weighed, wrapped, and packaged.

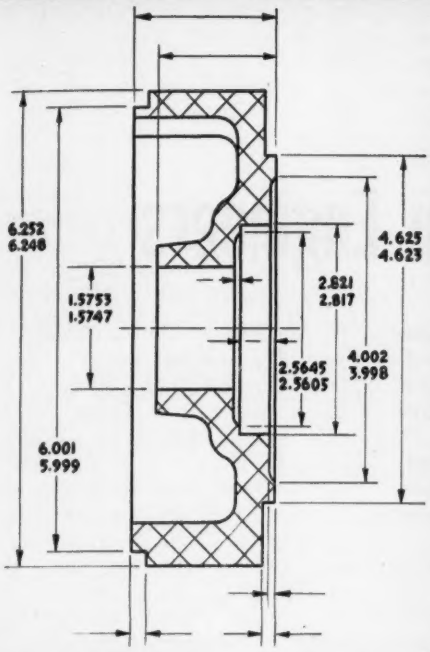
New developments in hot dipped tin plate production are developments of the Tennessee Coal, Iron and Railroad Co. and include features which are the subject of pending patent applications.

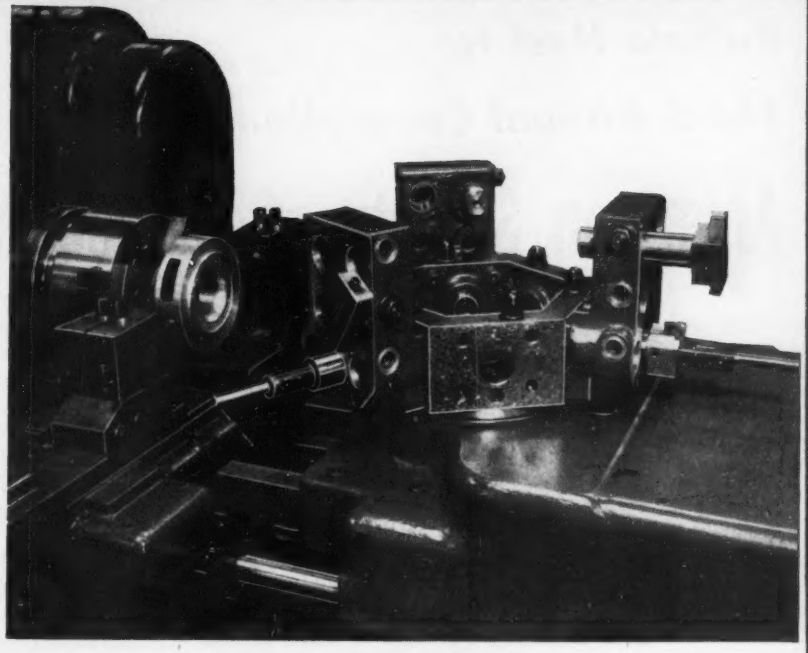


From a paper presented before the American Society of Mechanical Engineers, New Orleans, March 1-5.

Fig. 3 — Prime piler with finished load of plate on roller conveyor

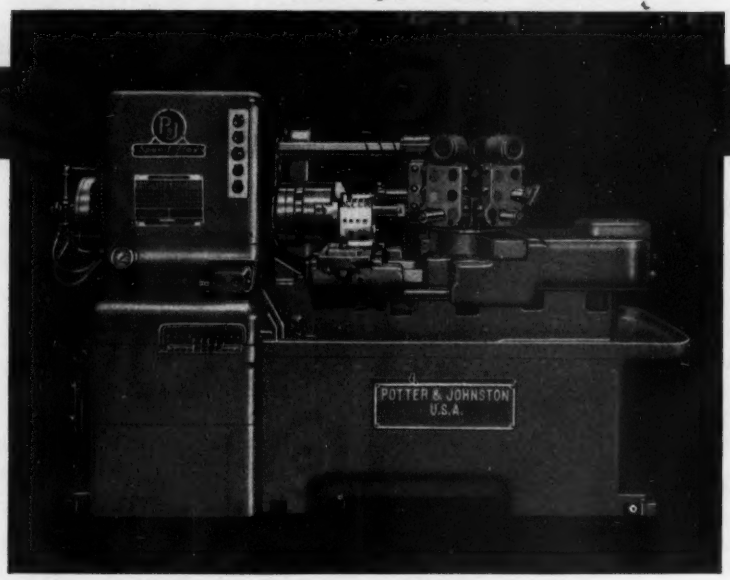
Fig. 4—View of sheet turn-around and inspection wheel





THE PART... Aluminum mounting end plate demanding *fast* metal removal

THE METHOD... Combination setups of simple turning tools and boring bars



THE MACHINE... P & J's

3-U SPEED-FLEX

the new Automatic Turret Lathe which gives "special tool" efficiency with versatile, low cost standard tools on many jobs like this.

High spindle speeds plus P & J ingenuity in combining operations plus instant chucking with stop pin locating are just some of the reasons why 37.5 of these parts are roughed out in a 51 minute hour—every hour—by the 3-U Speed-Flex.

This piece is rough bored, counterbored, rough turned; shoulder is faced, both sides of rim are faced, outside shoulder is form turned; all these surfaces then are "rough" finished and finally inner shoulder is size-turned. Only three turret faces are used.

If you have work up to 6 inches in diameter—nonferrous or ferrous castings, forgings or pressings—write to P & J for details on the 3-U way of cutting your costs by getting out more work to closer limits in less floor space. Operators prefer the 3-U Speed-Flex.

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Buffalo Host to

Third Annual Convention of

American Society of Lubrication Engineers

AN innovation of the third annual convention of American Society of Lubrication Engineers will be an exhibit of various lubrication devices and machinery and the lubricants themselves, presented by the manufacturers of these products. To be held on Monday, Tuesday and Wednesday, April 19, 20 and 21, the convention will be in Buffalo, N. Y. at Hotel Statler.

Over 20 papers will be presented at the technical sessions. New developments and techniques will be described by the speakers. Officers of the society are: O. L. Maag of Timken Roller Bearing Co., president; W. F. Leonard, secretary and treasurer; B. H. Jennings, professer of mechanical engineering, Northwestern University, vice president at large; D. D. Fuller of Columbia University, Eastern vice president; N. C. Penfold, Armour Research Foundation, Mid-Western vice president; and R. G. Larsen, Shell Development Co., Western vice president.

Among the companies exhibiting are the following: D. A. Stuart Oil Co., Chicago; Madison-Kipp Corp., Madison, Wis.; Cincinnati Milling Machine Co., Cincinnati; Farval Corp., Cleveland; Fox River Tool Co.; Bijur Lubricating Corp., Long Island City, N. Y.; Socony-Vacuum Oil Co. Inc., New York; Hilliard Corp., Elmira, N. Y.; Hodson Corp., Chicago; Trabon Engineering Corp., Cleveland; Dow Corning Corp., Midland, Mich.; Gerin Corp.; C. B. Dolge Co., Westport, Conn.; Manzel Inc., Buffalo.

E. F. Houghton & Co., Philadelphia; Bowen Products Corp., Ecorse, Mich.; Freedom-Valvoline Oil Co., Cincinnati; C. A. Norgren Co., Denver, Colo.; Gray Co. Inc., Minneapolis; Tide Water Associated Oil Co., New York; Stewart-Warner Corp., Chicago; Air-Maze Corp., Cleveland; Swan-Finch Oil Corp., New York; Gits Bros. Mfg. Co., Chicago; Bowser Inc., Fort Wayne, Ind.; Lincoln Engineering Co., St. Louis; *Lubrication Engineering,* Chicago.

PROGRAM

Third Annual Convention

The American Society of Lubrication Engineers
(All meetings held on 17th floor Hotel Statler)

Monday, April 19

9:00 a.m.—Registration, opening of exhibits

9:30 a.m.—Business meeting of officers and directors

11:00 a.m.—General society business meeting, president's message

12:30 p.m.—Welcome luncheon. Niagara Room

2:15 p.m.—Opening Technical Session—Assembly Room
Chairman—W. T. Everitt
"What Management Expects of Lubrication Engineers", W. H. McKaig, International Business Machines Corp.
"Lubrication Engineering Education", D. D. Fuller, Columbia University
"The Tapered Oil Film" with moving pictures illustrating principles of hydrodynamic lubrication, John Boyd, Westinghouse Electric Corp.

4:30 p.m.—Exhibits

9:00 p.m. Stag Smoker

Tuesday, April 20

9:30 a.m.—Technical Session—Assembly Room. Chemistry and Physics of Lubrication
Chairman—Thomas A. Marshall
"Mechanism of Action of Bearing Corrosion Inhibitors in Crankcase Lubricants", C. F. Prutton and J. D. Guttenplan, Case Institute of Technology
"Corrosion and Wear of Single Metal Crystals", A. T. Gwathmey, University of Virgina
"Alumina Filtering Media", E. M. Kipp, Aluminum Co. of America

9:30 a.m.—Technical Session—Center Wing. Mechanical Engineering in Lubrication
Chairman—J. E. Farry
"Vibration Problems in Bearing Design", A. C. Hagg, Westinghouse
"New Developments in Bearing Construction", A. M. Cadman, Cadman Mfg. Co.
"Antifriction Bearing Developments", A. W. Murray, SKF Industries

12:30 p.m.—Luncheon—Niagara Room
Chairman—Edward Perkins

2:15 p.m.—Concurrent General Technical Session—Assembly Room
Chairman—Burton Fowler
"Effects of Cutting Fluids and Power Requirements in Metal Cutting Operations", A. O. Schmidt and G. V. B. Sirotkin, Kearney & Trecker
"Performance of Diesel Engine Bearings", L. M. Tichvinsky, Washington University (St. Louis)
"Evaluation of Oil Filters", J. I. Clower, University of Delaware

2:15 p.m.—Concurrent General Technical Session—Center Wing
Chairman—James M. Courtright
"Textile Spindle Performance Characteristics", F. S. Jones and S. P. Marley, Socony-Vacuum Corp.
"Lubrication of Mining Machinery", J. J. Slomer, Goodman Mfg. Co.
"National Cash Register Co. Lubrication Practice", R. F. McKibben, National Cash Register Co.

7:00 p.m. Annual Banquet—Ballroom
Toastmaster—Burgess H. Jennings

Wednesday, April 21

9:30 a.m.—Technical Session on Machine Practice—Assembly Room
Chairman—George W. Miller
"Machine Tool Lubrication from the Builders Point of View", F. O. Hoagland, Pratt & Whitney
"Cutting and Grinding Oils", W.

H. Oldacre, D. A. Stuart Oil Co.

9:30 a.m.—General Technical Session —Center Wing

Chairman—Dr. W. H. Millett

"Laboratory Evaluation of Synthetic Oils and Greases", C. M. Murphy and Leon Newman, Naval Research Laboratory

"Fundamentals of Cutting Fluid Action", M. E. Merchant, Cincinnati Milling Machine Co.

"Friction and the Mechanism of Lubrication", J. J. Bikerman, Merck & Co.

2:15 p.m.—Technical Session on Test Methods and Their Interpretation —Assembly Room

Chairman—Melville Ehrlich

"The Significance of Lubricating Oil Tests", C. E. Hulme, control chemist, Kendall Refining Co.

"The Significance of Chemical Tests to Consumers of Lubricants", William Eisman Jr., E. F. Houghton & Co.

"Certain Functional Tests for Lubricants and Their Interpretation", T. G. Roehner and E. S. Carmichael

4:30 p.m.—Business Meeting of Officers and Directors

Plating Studies Aim For Improved Products

Preliminary results of research on quality of electroplated coating by American Electroplaters' Society indicate that quality of plated products can be greatly improved by good control in plating plant. This program which is supported by over 200 large and small industrial concerns is aimed at increasing output with existing equipment, reducing number of rejects and raising quality of goods.

Two research projects deal with impurities in plating baths, some of which have a tremendous effect when present in quantities as small as 1/1000-ounce per gallon. Studies include development of new and rapid means for analysis of impurities and methods of removing them from plating solutions.

New Type Interferometer Exhibited at ASTE Show

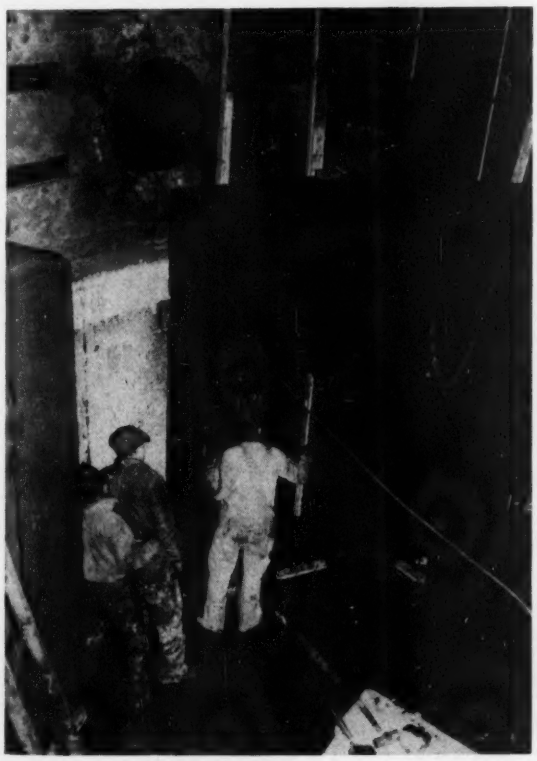
Accuracy and simplicity of operation in measuring flatness of surfaces are features of a new type interferometer which was exhibited for the first time at American Society of Tool Engineers show in Cleveland. Developed by Dr. W. Ewart Williams for Bausch & Lomb Optical Co., Rochester, N. Y., the precision device sets up shadowlike bands of interference in light reflected between its master optical flat, which has a surface accuracy of one-millionth of an inch, and the object being tested.

Instrument's master optical flat is never brought in contact with object under inspection thus eliminating possibility of it being scratched, worn out or distorted. Surfaces with as much as a 4-inch recess may be viewed with the instrument, and both end surfaces of a gage block may be checked at the same time to determine whether the two surfaces are parallel to each other.

Safety Provisions for Conveyors Established

First nationally acceptable safety provisions for construction and operation of mechanical conveyors and conveying equipment were recently announced by American Standards Association, New York. The experience of a wide variety of national groups concerned with manufacture and use of conveying equipment and with safety of workers in plants using this equipment was called upon in preparing recommendations. These groups were represented on the American Standards Association committee which worked under leadership of National Bureau of Casualty and Surety Underwriters and American Society of Mechanical Engineers.

Safety provisions for all types of conveyors are included in new standard. Special provisions for safe operation are given for each type. Safety of worker or operator is given first consideration, but efficient use of conveyor also has been kept in mind in selecting guards and other safety devices.



Larger Carbon Blocks

. . . for blast furnace linings reduce cost of installation

SAVINGS in fabrication expense and decrease in installation time were made possible through the installation of the first Thacher type carbon blocks in Federal Furnace "B" of Interlake Iron Corp., Chicago. Instead of using the approximately 250 carbon blocks of smaller size that would have been necessary for a double wall hearth lining, only 53 of the new type blocks developed by Great Lakes Carbon Corp., Niagara Falls, N. Y., were needed.

Each of the 30 monolithic hearth wall blocks is 24 inches thick and 10 feet high. In the accompanying illustration is shown the installation of wall blocks, sides of which are key cut to give a barrel stave effect. There are 20 bottom blocks 30 inches thick laid in a single layer with carbon paste of same basic elements as the blocks themselves rammed into space between blocks. Three specially designed blocks at the iron notch complete the carbon lining.

LETTERS *to the Editors...*

From A Friend

As a subscriber to STEEL, I would like to comment that your publication is proving to be very interesting as well as enlightening. The fact that STEEL is published weekly gives it added significance.

I would like, respectfully, to introduce myself as the comparatively new owner of Metal Processing Co. of Milwaukee, one of the few Kolene process jobbing plants in the country. As the result of a number of plant changes since our entry into this line, we are now able to handle a much greater volume of business. We are contemplating the publishing of some literature and in this regard I have a request to make.

With your kind permission I would like to use parts of the material which appeared in the May 7, 1945 issue of STEEL under the heading "Cleaning Metal with New Oxidizing-Reducing Process", written by Mr. G. W. Birdsall, then an associate editor of your publication.

If you have published any other material which has not come to my attention, I would appreciate knowing about it.

S. G. Greis, Owner
Metal Processing Co.
Milwaukee, Wis.

Request granted, providing you include a credit line, indicating STEEL as the source. Another article, "Metal Cleaning, Methods and Results,", from the May 5, 1947 issue may also be of help to you.—The Editors.

Production Control

It would be greatly appreciated if you would send me a list of the various articles that have appeared in STEEL during the past few years on the subjects of production control, scheduling of rolling mills and production management within steel plants.

H. I. Linn
Lee's Summit, Mo.

Articles published on the above subjects are as follows: "Visual Scheduling System Steps Up Shipment of Steel Orders", Aug. 25, 1947; "Simplified Production Scheduling", Sept. 29, 1947.—The Editors.

Silicon Sheet Info

We are manufacturers of oil immersed distribution transformers. We have been searching for a pamphlet that contains information concerning flux densities and permeabilities of various gages and various core losses of silicon sheet that are used for making the cores of these transformers.

We know that there is such a pamphlet in existence; however, we have not been able to locate one of them. Could you give us information so that we may be able to procure the same? We know that your magazine covers a lot of technical items, but we would like to have something a little more specific, as stated above.

We believe that the information we require would be contained in a series of curves for the various gages of silicon sheet.

A. W. Koppus
Larkin Lectro Products Corp.
New York, N. Y.

Australia Asks

I wish to inquire if you have any literature or information dealing with the properties and heat treatment of a metal known as "Z alloy".

My only contact with this metal to date was in a brief article I read in your publication dated Feb. 19, 1940, and from the description contained therein I think it would do the job I require.

A. E. Lofts
Mascot, N.S.W.
Australia

Plating on Propellers

In your March 8th issue of STEEL, there is an item on page 81, "Engineering News at a Glance", about which we would like more information. This refers to nickel plating wood propellers.

We would like to know if you can furnish the address of the concern manufacturing the equipment to do this work.

Jack Locke, General Manager
U. S. Bobbin & Shuttle Co.
Lawrence, Mass.

We do not have any information on who supplied Bone with the equipment. It is entirely possible the machine or process being used was developed specifically for this purpose by the company itself. It is suggested you write the company, Glendale, Calif.—The Editors.

Sent, By Jominy

Please forward to this arsenal to the attention of the undersigned, tear sheets of the article "Selecting Automotive Steels" by W. E. Jominy, published in the March 8, 1948 issue of STEEL.

A. H. Maggs, Engineer
Watervliet Arsenal
Watervliet, N. Y.

Subject: Fatigue

So now you are interested in fatigue, as evidenced by the article by Benjamin Melnitsky, entitled "What To Do About Industrial Fatigue". Well, why not: It does interfere a good deal with steady production, if the men get too tired before the end of the working day. But, and here is the answer to the $64 question, that can be very easily remedied, and it is so simple at that.

Of course, I am no longer in the steel business, although I used to be in the employ of the Krupp Steel Works a number of times some half a century ago. Most of the time I have been engaged as designing and consulting engineer in the automotive industry, member of the SAE since January, 1907 and of the German equivalent, the former ATG, since 1904.

But I realized a great many years ago that the finest automotive vehicle on earth is the human body, the living temple of God; and how little attention we pay to it, and when we do it often is too late. Now, if there is any real interest in the steel industry in methods to reduce fatigue, I shall be very glad to show you how to accomplish that end.

Incidentally, while fatigue reduction may be your primary aim, you will accomplish a lot more than that. You will be building better health and you will be building better human beings; and if we concentrate the first efforts and demonstrations in this locality, then we will also be building a better city.

My special field is the "science of health" and in particular, "preventive dietetics". That is the science to live, so that you never need a doctor, or medicine or an operation, that you are never sick, never have a headache or stomach ache or any ache. It is one way to reduce absenteeism, sickness among workers, loss of efficiency due to colds or other indisposition, that are not bad enough to make them stay home.

Joseph Schaeffers, D.D., M.E.
Cleveland, O.

Die Casting Tear Sheets

I have read with much interest two installments of the article "Modern Die Casting Practice", written by Mr. R. J. Reel of Hydraulic Press Mfg. Co.

I understand that these installments appeared in a series of four, two of which I missed. Would it be possible for me to procure tear sheets on all four installments?

William Bosyk
Westinghouse Electric Corp.
Springfield, Mass.

Austria's Interested

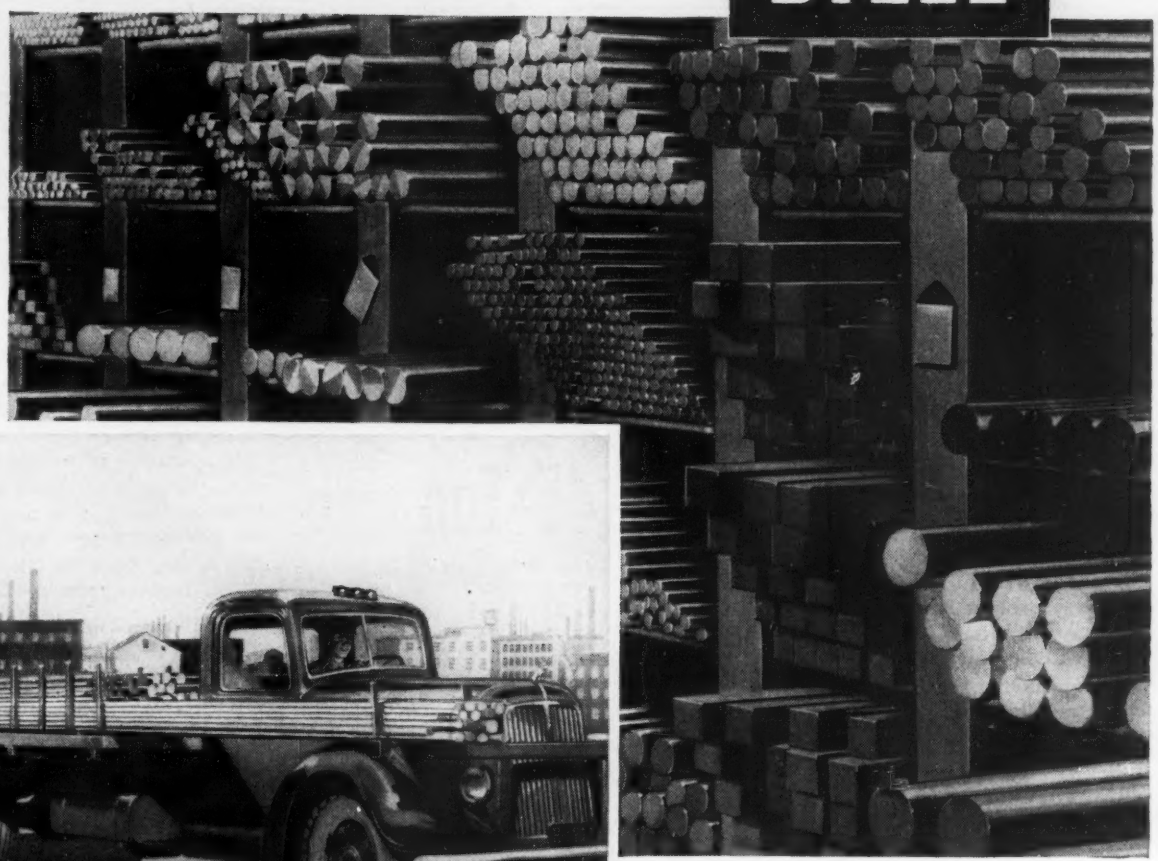
In the January 19, 1948 issue of your magazine I read the interesting article by Mr. L. E. Browne concerning an "Electric Ingot Method for Continuous Casting Alloys". I would be very glad to get more details of this process, because I believe that it might be very useful for Austria. Being a consulting engineer and metallurgist, I would have the possibilities to introduce the process in Austria.

Prof. Carl Valerian Schwarz
Salzburg, Austria

Call Your Steel Distributor

FOR COLD FINISHED BAR STEEL

J&L STEEL



Typical distributor's stock of cold finished bar steel

for Quick Service *from* Well-Assorted Stocks *of* High Quality Cold Finished Steel

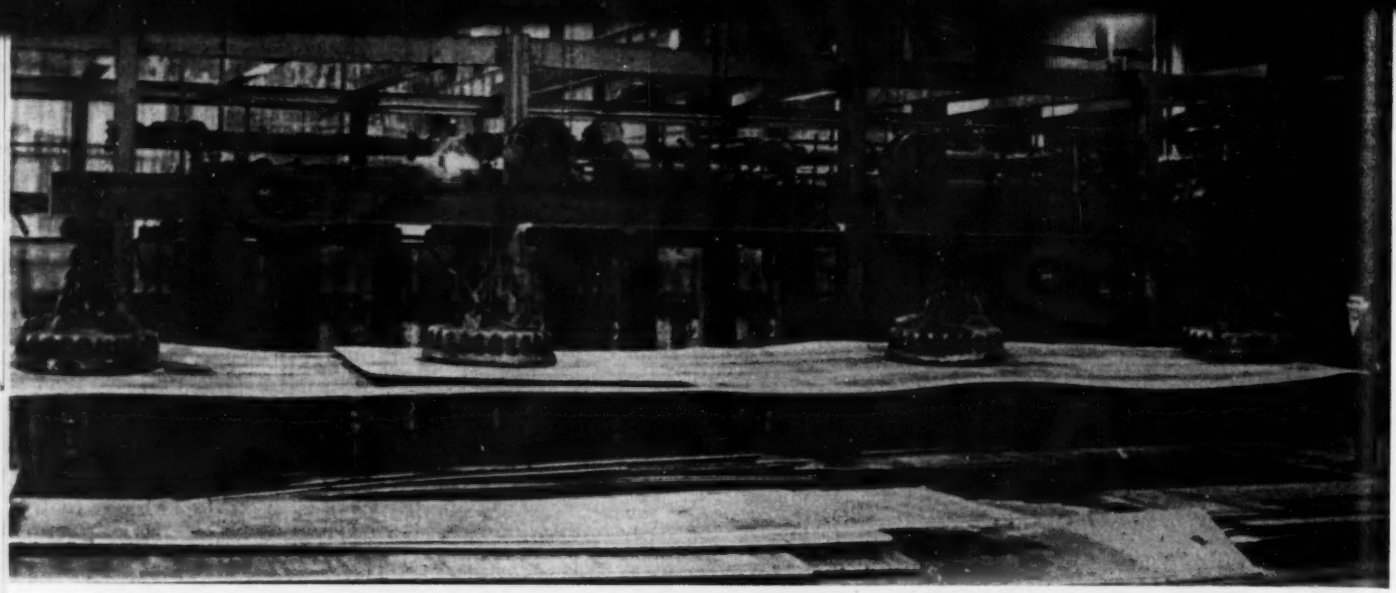
When you need cold finished bar steel —and need it in a hurry—call your steel distributor.

He maintains complete stocks of cold finished bar steel in a wide variety of sizes and grades. He is conveniently located. He is equipped to make quick deliveries to meet both your normal and your emergency requirements.

J&L cold finished steel, in sizes, shapes and grades to meet your requirements, is available through leading steel distributors throughout the United States.

For the name of the steel distributor nearest you who stocks J&L Cold Finished Steel write to Room 404, Jones & Laughlin Building, Pittsburgh 30, Pa.

JONES & LAUGHLIN STEEL CORPORATION



BRITISH ANNEALING FURNACE

Heat Treats 45-Ton Plates

SO easily operated that for a considerable period of time during the last war it was handled by one girl with occasional supervision, an annealing furnace, installed in the Port Talbot Works of Guest Keen Baldwins Iron & Steel Co. Ltd., has a 45 x 11 feet steel plate capacity. The furnace, shown in Figs. 1 and 2, one of the largest in England, is part of the complete installation which includes a table on each side for loading and cooling, respectively, served by a mobile ground type charging machine.

Installed by Gibbons Brothers Ltd., Dudley, Worcester, the gas-fired unit is fitted with four-zone pneumatically operated pyrometric equipment which automatically controls the temperature of each of the four individual zones by four thermocouples above the charge. The charge temperature is recorded by four other thermocouples in contact with the underside of the plates. Composition and pressure of the heating chamber atmosphere are also automatically controlled, control of pressure being assisted by a short venturi chimney stack.

Loading and cooling tables are similar in size to the furnace bottom which is constructed of interlocking refractory blocks. The treated plates are said to be quite flat and no buckling difficulty has been reported.

Plates to be treated arrive from the mills by overhead crane, picked up by its four magnets. They are placed on the loading table alongside the furnace by the crane, as shown in Fig. 1. They are then moved by a mobile charging machine into the charging end of the furnace, Fig. 2, this operation requiring about 1 minute. Upon completion of the heat treating, the plates are removed by the mobile machine and deposited on the cooling table on the opposite side of the furnace from the loading table.

Overhead magnet crane removes plates from the cooling table, taking them back over the furnace for subsequent processing. A safety structure protects the furnace piping and valves on the top of the furnace from accidental dropping of the crane load. A further safeguard is an isolating switch which prevents the crane from traveling over the furnace when someone is on top of the furnace. An electrical interlock also prevents the load from being carried over the furnace below a certain height.

Furnace was designed to heat treat steel plates up to 45 feet long, about 11 feet wide and up to 2¾ inches thick with a total weight of about 25 tons. Rated capacity of the charging machine is 25 tons. The heating chamber is 47 feet 3 inches long and 12 feet wide. A pushbutton in the

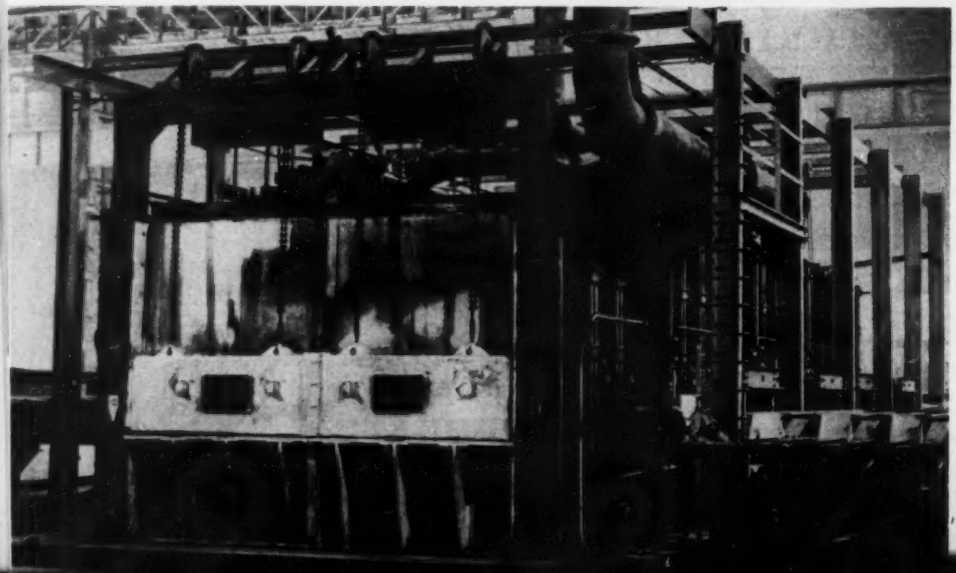
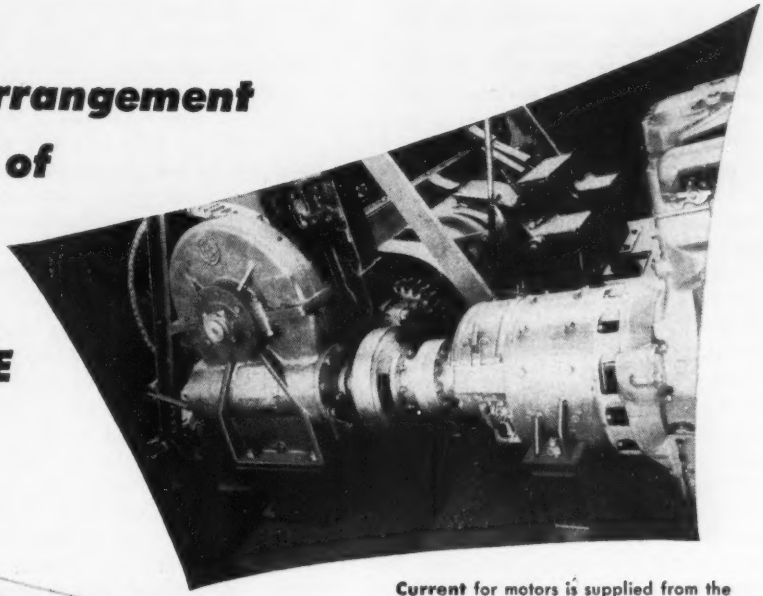
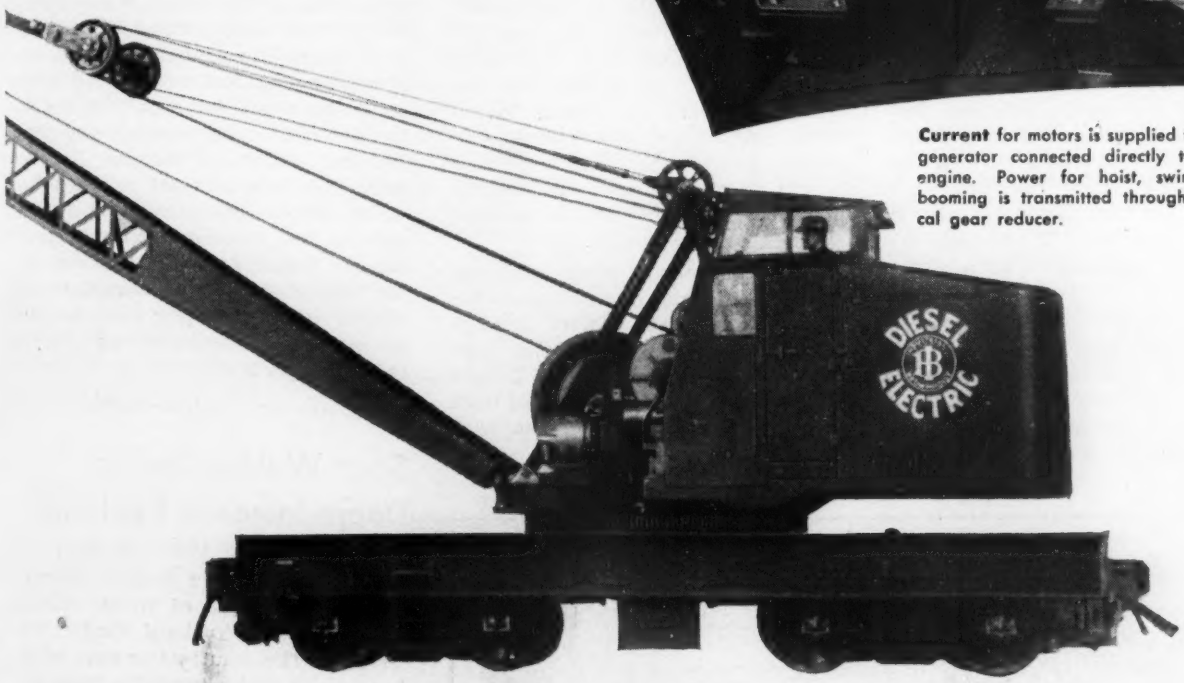


Fig. 1 (above)—Steel plates being handled by four magnets suspended from overhead crane. Notice furnace protecting framework in background

Fig. 2 (left)—Charging end of blast furnace gas-fired steel plate annealing furnace, showing loading and cooling tables. Door is crank driven and merely reverses direction, should its limit switch fail

Simplified power arrangement increases efficiency of BROWNHOIST DIESEL ELECTRIC LOCOMOTIVE-CRANE





Current for motors is supplied from the generator connected directly to diesel engine. Power for hoist, swing, and booming is transmitted through a helical gear reducer.

Electric swing, available, is powered by a separate generator which is also supplied for magnet service or night lighting.

Simplified design has increased efficiency in the new Brownhoist Diesel Electric Locomotive-Crane . . . and *at the same time reduced maintenance costs in heavy switching service.* Two examples of this advanced Brownhoist engineering are illustrated. Others include: A.A.R. cast steel side frame trucks with inside hung spring mounted travel motors with 4" clearance from top of rail; travel speeds up to 15 M.P.H.; ample power to permit double duty as a switch engine and heavy duty Locomotive-Crane; 360° visibility from Monitor-type cab; safe worm driven boom hoist; hoist and boom drums in full view of operator. You get *all these features and more with the new* Brownhoist Diesel Electric Locomotive-Crane.

Write for complete information.

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charging machine operator's cab controls the electromechanically operated door on the furnace.

Blast furnace gas from the Margam Works, cleaned so that it has a dust content not in excess of 0.009 grams per cubic meter, is supplied to the furnace. An adjacent gasholder is used as a reservoir. The roof combustion principle is used in which the gas is fed into the furnace through inlets on each side beneath the roof level. Roof consists of flat firebrick tiles carried horizontally by a series of arches.

Tiles are perforated by numerous uniformly spaced small holes of equal diameter through which hot air passes into the fuel gas below, thus producing small jets of flame of equal size and heat generating capacity. These jets burn vertically downward and merge into one uniform blanket flame all over the furnace hearth. Air spaces are in the furnace roof above the tile, into which hot air from the recuperator is fed under pressure. The furnace atmosphere is maintained at a slight pressure.

Each of the four sections or zones of the furnace has its own gas and air valves, recuperators and hand controlled flue damper. Waste gases leave the recuperator by the four dampers and flow out through the venturi stack to the atmosphere. The draft is created by air blown through the venturi-shaped throat of the waste-gas ejector.

The four zones are further subdivided into a total of 18 sections, each with its own gas and air setting valves and recuperators. Hot combustion air from each sectional recuperator is carried to its own section of the reservoir incorporated in the furnace roof through refractory tubes built in the side walls.

Charging machine has six arms arranged to enter the furnace in six slots running almost its entire length. Lower charger arms have rollers upon which the arms travel. Upper charger arms, capable of being raised mechanically and separated from the lower ones, actually raise the plates to be charged. When charging, the arms travel into the furnace in the lifted position and are lowered, depositing the charge upon the furnace hearth. They return in the lowered position. The procedure is reversed for removing the charge.

Three movements of the charging machine—lift, charge and travel—are driven by separate motors through reduction gears, each protected from over-run by limit switches. Length of machine is 56 feet 6 inches with arms withdrawn and 104 feet with arms extended.

Instruments used on the furnace insure uniform temperature distribution, together with close control of temperature and atmosphere. Fuel gas input is continuously recorded by a ring-balance indicating recorder. As stated previously, the furnace is divided into four zones, each controlled by a pyrometric ampliset pneumatic controller. Furnace pressure is kept constant by an ampliset low range pressure controller which operates a butterfly valve in the stack.

Temperature of the plate under treatment is indicated by four pyrometer recorders fitted with base metal thermocouples whose junctions are in contact with the plates being heat treated. The furnace zone temperature recorder controllers operate lever motors to control gas and air valves feeding fuel and air to each set of burners. Air supply is fed to the air valve by a constant pressure fan and the blast furnace gas is controlled at a constant pressure by an instrument operating a butterfly valve in the gas main serving all four zones. Pressure control operates on the maximum gas consumption of 110,000 cubic feet per hour to the minimum of approximately 30,000 cubic feet per hour.

From *Iron and Coal Trades Review.*

HAULING CHAMP: Welder is shown working on nose compartment of a streamlined electric locomotive being built at Erie, Pa. plant of General Electric Co., for Virginian Railway. Cab of the 6800 horsepower locomotive which has a length of 150 feet, 8 inches between knuckles is all-welded from structural steel shapes and plates and is divided into three compartments. Sub and truck frames are made of heavy steel castings

Spot Welder Trailer Doors Increase Payloads

Strengthened door construction with a reduction in weight thereby increasing payload of truck trailers is reported by Fruehauf Trailer Co., Detroit. Three automatic spot welding presses and a turntable type fixture at which brackets are attached with portable welding guns are used for assembling basic framework or doors. All equipment was designed co-operatively by the company's engineers and those from Progressive Welder Co., Detroit.

Both right and left hand door frames are made interchangeably on the machines which automatically weld 168 of the 250 spot welds required. Two of the machines have adjustable welding dies and gun carriers and the third requires only adjustment of welding dies with guns being fixed. Operating cycle is 16 seconds for welding 20 gage hot rolled mild steel. Two operators per machine can produce 60 welded assemblies per hour.

—o—

Steps in the development of metallurgy and power are described in current issue of *Hoover Sphere,* publication of Hoover Ball & Bearing Co., Ann Arbor, Mich., beginning with volume 12.

45-Second SPECTROCHEMICAL ANALYSIS

. . . of metals possible by direct-reading method

UP to 11 elements can be measured simultaneously by a direct-reading spectrochemical method of analysis which makes possible the evaluation of a properly prepared sample in 45 seconds. The procedure involves the use of a special instrument, the Quantometer, capable of determining about 70 of the 92 elements, or those having spectral lines readily excitable in the region of 2000 to 6000 angstrom units. These would include, in steel or aluminum alloys, for instance, manganese, silicon, copper, nickel chromium, vanadium, molybdenum, tungsten, magnesium, zinc, titanium, cobalt, columbium.

In general, it is reported that the high sensitivity of the spectrochemical method is maintained in the new equipment. The photographic part of ordinary spectrographic methods is replaced by a precision electrical integrating device, making possible very high accuracy

Manufactured by Applied Research Laboratories, Glendale, Calif, the Quantometer consists of two main units: A special spectrometer unit and a recording console.

The spectrometer unit proper has an optical bench, an arc-spark stand, a primary slit, and a diffraction grating with its holder much as in a conventional spectrograph. However, beyond this, the resemblance ceases as the spectrometer is designed with a long focal curve along which slit covered receivers can be moved to receive the light from any spectral line desired.

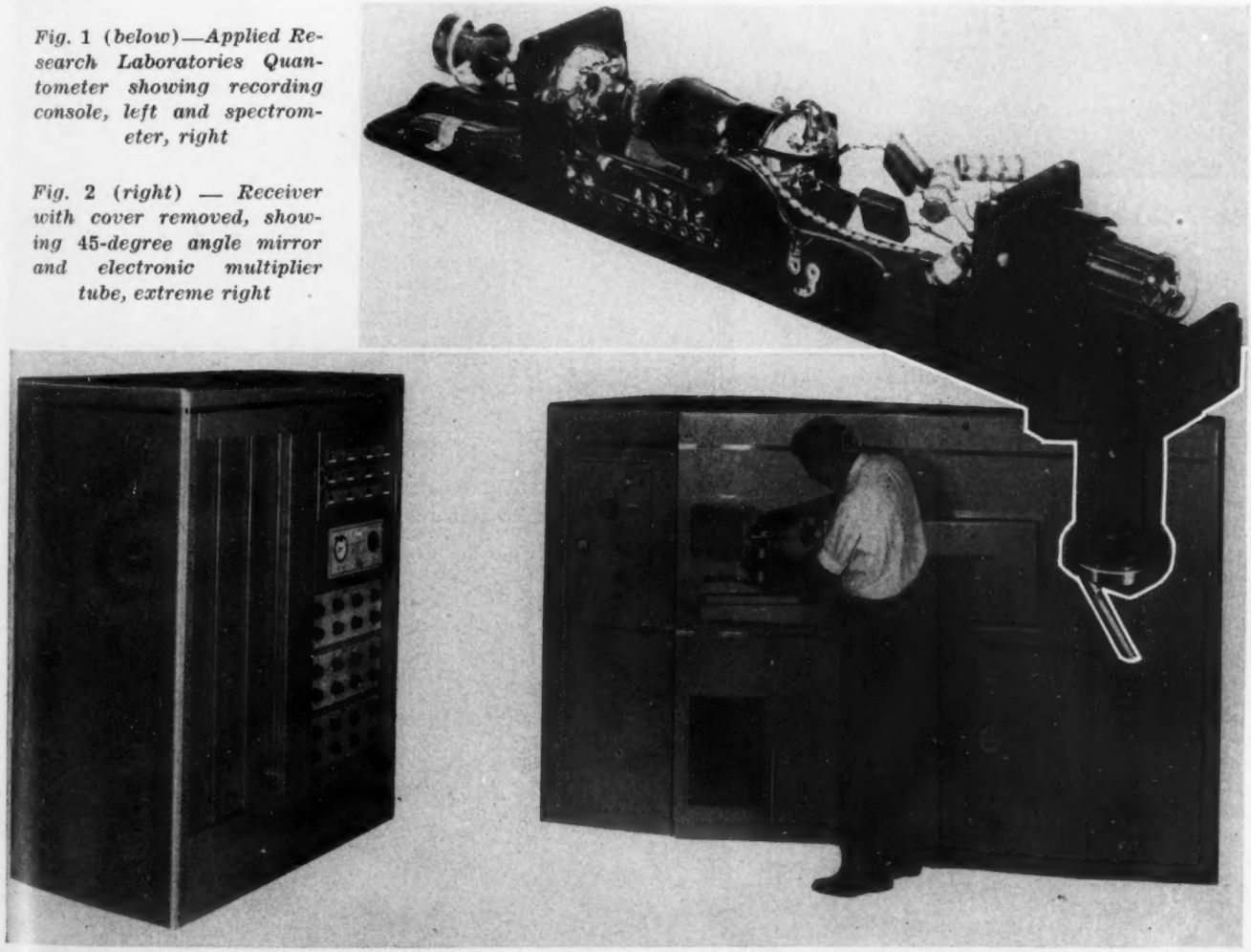
This motion is provided for as many as 12 receivers without serious interference between them and in such a manner that several lines close together in the spectrum can be measured at the same time Radiation which passes through the receiver slit falls upon an electron multiplier phototube.

Output current of this tube, which is proportional to the intensity of the light falling upon the cathode, is then integrated and converted into a series of electrical impulses, the sum of which is proportional to the integrated intensity of the spectral line. These impulses are amplified by means of an electronic amplifier which is an integral part of receiver, and passed on to a recording console.

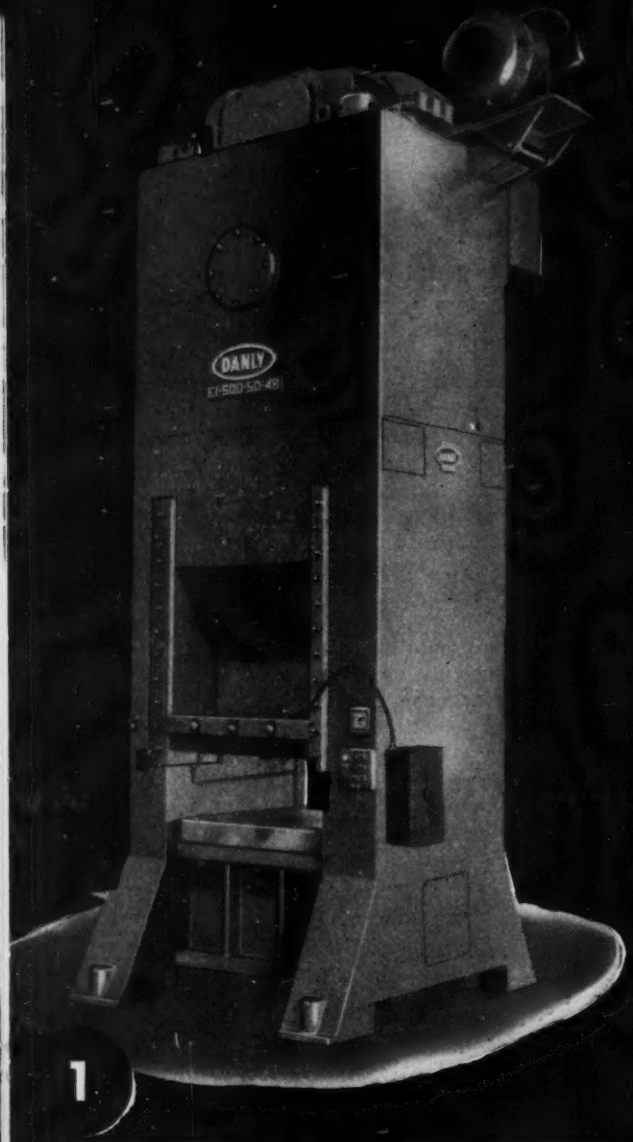
Receiver—Each receiver consists of

Fig. 1 (below)—Applied Research Laboratories Quantometer showing recording console, left and spectrometer, right

Fig. 2 (right) — Receiver with cover removed, showing 45-degree angle mirror and electronic multiplier tube, extreme right



DANLY STRAIGHT SI



1

THE RUGGED strength and precision construction of Danly Presses is a guarantee of greater production and continuing accuracy of stampings.

A circulating, filtered lubrication system keeps working parts under direct controlled lubrication.

The Danly Air Friction clutch is so designed that most of the moving parts rotate with the flywheel at all times, materially reducing the energy required for starting and stopping. Fully ventilated for cool operation, this clutch has, in its design, the charac-

2

1 POINT PRESSES

The 500 ton Eccentric Gear Press (*above*) was designed for a job which required a comparatively high tonnage exerted over a small area.

The heavy construction and massive rigidity of this press insure the accuracy of stamped parts, the safety of the dies. Danly single point presses are standard from 100 to 600 tons capacity.

2 POINT PRESSES

Typical of the entire line of Eccentric Gear Presses, the cleanly designed two point 400 ton press (*center*) is suitable for right to left or front to back feeding. Absence of overhanging machinery leaves plenty of headroom for feeding and scrap removal. 2 point presses are standard from 100 to 1200 tons capacity.

4 POINT PRESSES

The 1000 ton 4 point press (*right*) has a slide connection or suspension point at each corner of the slide. This method of suspension keeps the slide and bed in parallel even when off center dies are consistently used. Danly 4 point presses are standard from 100 to 2000 tons capacity.

Write for circular on Danly Eccentric Gear Straight-Side Presses

DANLY MACHINE SPECIALTIES, INC.,

IT SIDE PRESSES HAVE . . .

teristics that make for long life and low maintenance.

Notice the rugged massiveness of the presses shown below—the modern enclosed construction that increases safety and operator acceptance.

Men who work with presses—supervisors, maintenance men, and operators alike—will find in the Danly Press, the features they want for better, faster press operation—the features that result in greater volume production of more accurate stampings at lower unit cost!

4

1 Sound, Clean Welding
2 Stress Relieved Weldments
3 Precision Machining
4 Rigid Enclosed Construction
5 Accurate Alignment
6 Circulating Filtered Lubrication System
7 Disc-Type Clutch and Drum Brake
8 Electrical Controlling

THESE FEATURES GIVE YOU—

1 Accurate Stampings
2 Trouble-free Operation
3 Less Tool Wear
4 Ease of Operation
5 Safety
6 Accessibility
7 Simplified Maintenance

Result—

Greater volume production of more accurate stampings at *lower unit cost.*

., 2100 SOUTH 52ND AVENUE • CHICAGO 50, ILLINOIS

a mechanical and electrical assembly. The mechanical assembly moves along the ways and supports the mirror and slit components. Since all of the amplifier associated with the signal output is an integral portion of the receiver, serious leakage problems are entirely avoided.

Console—The recording console provides all of the specialized voltages to operate the multiplier-phototubes and attendant amplifiers. It is also equipped with electrical impulse recorders of a unique motor powered type which register the impulses furnished by the receivers.

This unit is designed on the multiple-channel principle. Thus each receiver in the spectrometer has a separate low-voltage power supply and integrating recorder all housed in the console. By having one or two spare receivers and the channels, power packs, and recorders that go with them, as stand-by equipment, it is a relatively simple matter to switch over to unused components if trouble develops. Units requiring repair can then be removed and serviced when convenient.

Power Supplies—Low-voltage power packs supply filament and plate voltages for the integrating circuits and amplifiers which are built into the receivers. Four, eight or 12 of these are furnished to match the number of receivers being supplied. A Sola voltage-regulator supplies adequate constant voltage for these packs under most conditions of input line-voltage.

High-voltage power pack furnishes the voltage for the multiplier phototubes. Due to the low current drain, all receivers are supplied from a single power pack.

Recorders — Integrating recorders furnish the final analytical results, allowing the instrument to be direct reading. Each is a motor-driven electro-magnetic counter driving a 50-inch tape on which is printed a percentage sequence corresponding to the typical spectrochemical working scale. By terminating the count at a definite integrated intensity on the internal standard line as measured on a recorder, the chemical percentage for each element being measured is read off directly from the corresponding tape.

This is facilitated by having one end of each tape pass over a sprocket which is directly behind a reading aperture at the front of the console case. Thus the percentage composition, determined automatically, appears at these apertures at the end of the sparking cycle. These results are entered on the operator's analytical form. He presses a button to reset the recorders, and the unit is ready to analyze the next sample.

Analysis—The system of producing analyses is simple. One receiver is placed so that it receives radiation from a line of the internal standard element. The sensitivity of this receiver is adjusted by controls on the console so that its recorder goes through one cycle of 500 counts in the desired time of analysis, say 25 seconds. Other receivers are placed so as to receive radiation from lines of the various elements to be determined and their impulses are counted on other individual recorders.

Sensitivities of these receivers are adjusted by means of standard samples until the corresponding recorders read directly the correct analysis of their elements upon the completion of the internal standard recorder's cycle. Samples of unknown analysis are then put through the identical cycle as the standards, to obtain a direct reading analysis of the various elements.

In order to facilitate calibration and adjustment, the sensivity of each multiplier phototube is controlled by a coarse and fine tapped-switch control, which is mounted on the front of the console below the tape-reading apertures. With this arrangement a hundred-fold variation in sensitivity can be achieved in steps of 0.3 per cent. Thus, lines of widely differing intensity can be compared with great accuracy, and adjustment of the printed tape scales to the standards can be made with a high degree of precision.

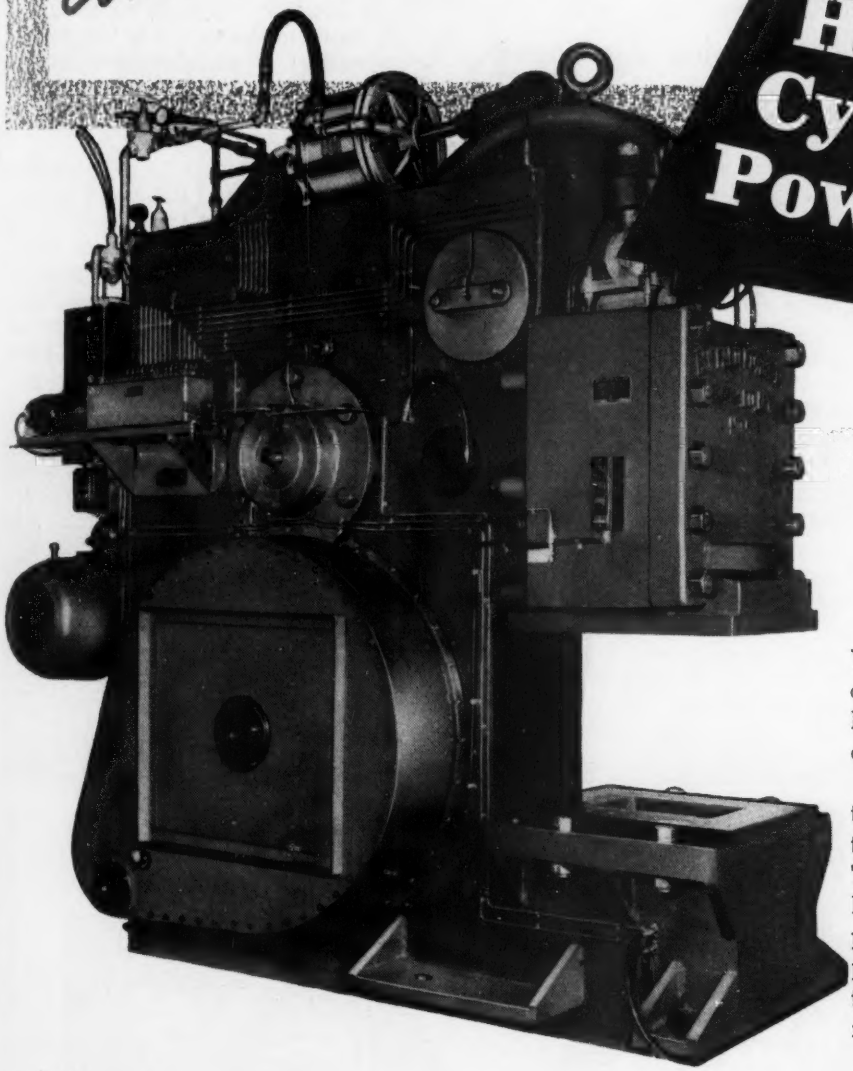
In this manner, according to Applied Research engineers, the Quantometer solves what is said to be one of the most annoying limitations of

LILLIPUTIAN MACHINING: Tiny air pilot valve liner less than ¾-inch long and 5/16-inch diameter, receives a 0.125-inch diameter longitudinal hole drilled and bored with carbide tipped tool. Rivet head with specially built collet at Bailey Meter Co., Cleveland, contains tools for centering, drilling, boring and two reaming operations. Control of final size and finish is accomplished by burnishing with carbide tool, tolerances being held to plus or minus 0.0001-inch both for hole diameter and run out—STEEL Staff Photo

for rugged duty in heavy equipment

Another of the 1001 applications of...

Hanna Cylinder Power ★

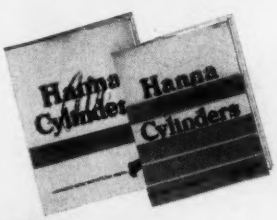


• *Hanna Cylinders are made to stand up under the most rigorous requirements. Here, a Hanna Cylinder operates efficiently, powerfully and reliably on a giant Buffalo Forge No. 54 Shear, an application where a sturdy cylinder must be used for smooth, dependable power.*

You see Hanna Cylinder Power in action throughout industry in all kinds of applications . . . in all types of equipment . . . and it's no wonder.

Where there is a need for a controlled push, pull, lift, press or clamp, there is a need for Hanna Cylinders. They operate smoothly, economically, efficiently — they reduce or replace manual effort—and they simplify the actuation and control of thousands of machines and equipment.

There are standard model Hanna Cylinders for nearly all mounting requirements . . . for a wide range of pressures . . . for pneumatic or hydraulic operation . . . for your selection. Get the facts and see where Cylinder Power can be applied in your equipment.



Ask for **Catalog 233 (Hydraulic Cylinders) and, or Catalog 234 (Air Cylinders). No obligation.**

Hanna Engineering Works

HYDRAULIC AND PNEUMATIC EQUIPMENT . . . CYLINDERS . . . VALVES . . . RIVETERS

1765 Elston Avenue, Chicago 22, Illinois

spectrography—the necessity of having the lines of the elements to be determined at about the same level of intensity as the internal standard line. A still greater problem of spectrography, variable contrast of the photographic emulsion with wavelength, does not exist in the Quantometer, because the multiplier-phototubes have a linear response with intensity at all wavelengths, and the recording system employed makes full use of that property.

The unit source is a combination of sources which have proved most successful for use with the direct reading instrument. It consists of: (1) A high voltage spark unit in which four condensers are charged to 18,000 volts through vacuum rectifier tubes and then discharged by a large synchronous rotary gap to produce 240 spark trains per second; (2) a multisource unit which by means of an ignitor discharges a large capacity (up to 60 microfarads) through the analytical gap 60 times per second; and (3) a low voltage (300 volts) high current (up to 15 amperes) direct current arc. By rapid switching from one source to another it is possible to analyze a sample first with one source and then with another in order to obtain a complete analysis of all significant elements both rapidly and accurately.

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Improvements in machine tool design of interest to American machine tool manufacturers are described and illustrated in reports on the German machine tool industry available from Office of Technical Services, Department of Commerce, Washington. Prepared by American and British industrial intelligence investigators, reports are based on visits to German plants in 1945 and 1946. They include information on sizes, speeds and work handling capacities of the machine tools.

Portable Gas Turbine Units Being Developed

Emergency power requirements may be filled within the next few years by mobile gas turbine plants now under development by Allis-Chalmers Mfg. Co., Milwaukee. Studies have already been made of 3000 and 6000 kilowatt units which could operate as a sole source of power or be synchronized with an existing power system. Standard draft gear and air brakes would permit these power plants to be moved in freight trains by removing regenerator and air exhaust stacks for standard clearance.

In cases where regular plants are out of operation or when industrial plants are faced with a sudden temporary need for extra power, portable units could be quickly located on a siding requiring only fuel line connections to tank cars or storage tanks in addition to electric transmission line connections. Both units operate on the simple gas turbine cycle with regenerator, but the larger unit operates at lower speed and does not require a reduction gear.

Papers on Ceramics Scheduled for Meeting

More than 130 papers will be presented at technical sessions during Fiftieth Annual Meeting of American Ceramic Society at Palmer House, Chicago, from April 25 to 30, 1948. Included in the program are 22 papers on enamel in addition to those on glass, materials and equipment, refractories and structural clay products.

Among the papers to be presented on enameling are: "Residual Stresses in Enameled Sheet-Iron Specimens", "Preliminary Study of Ceramic Coatings for High Temperature Protection of Molybdenum", "Comparison of Various Antimonates as Opacifiers in Dry-Process Enamels for Cast Iron", "Some Observations on Reactions of Enamel and Iron", and "Weather Resistance of Porcelain Enameled Iron Structural Units."

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Relatively low in pigment is the heavy duty drawing compound developed by Northwest Chemical Co., 9310 Roselawn, Detroit 4, Mich. Designed primarily for use without dilution, it may be thinned with up to two parts of water by volume to one of compound.

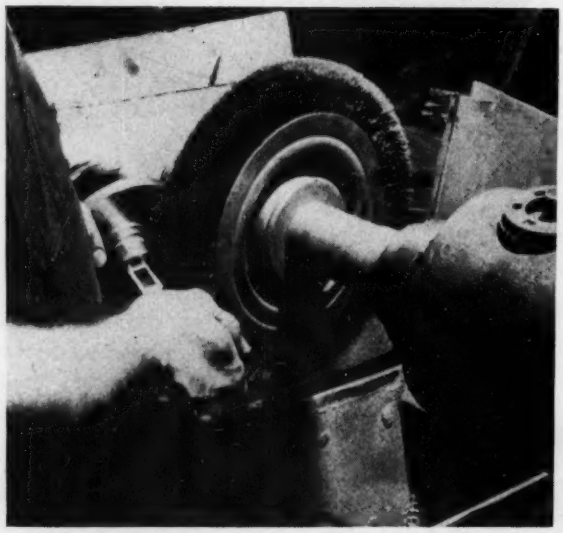
POWER BRUSH USES... *Increased in Light Metal Finishing*

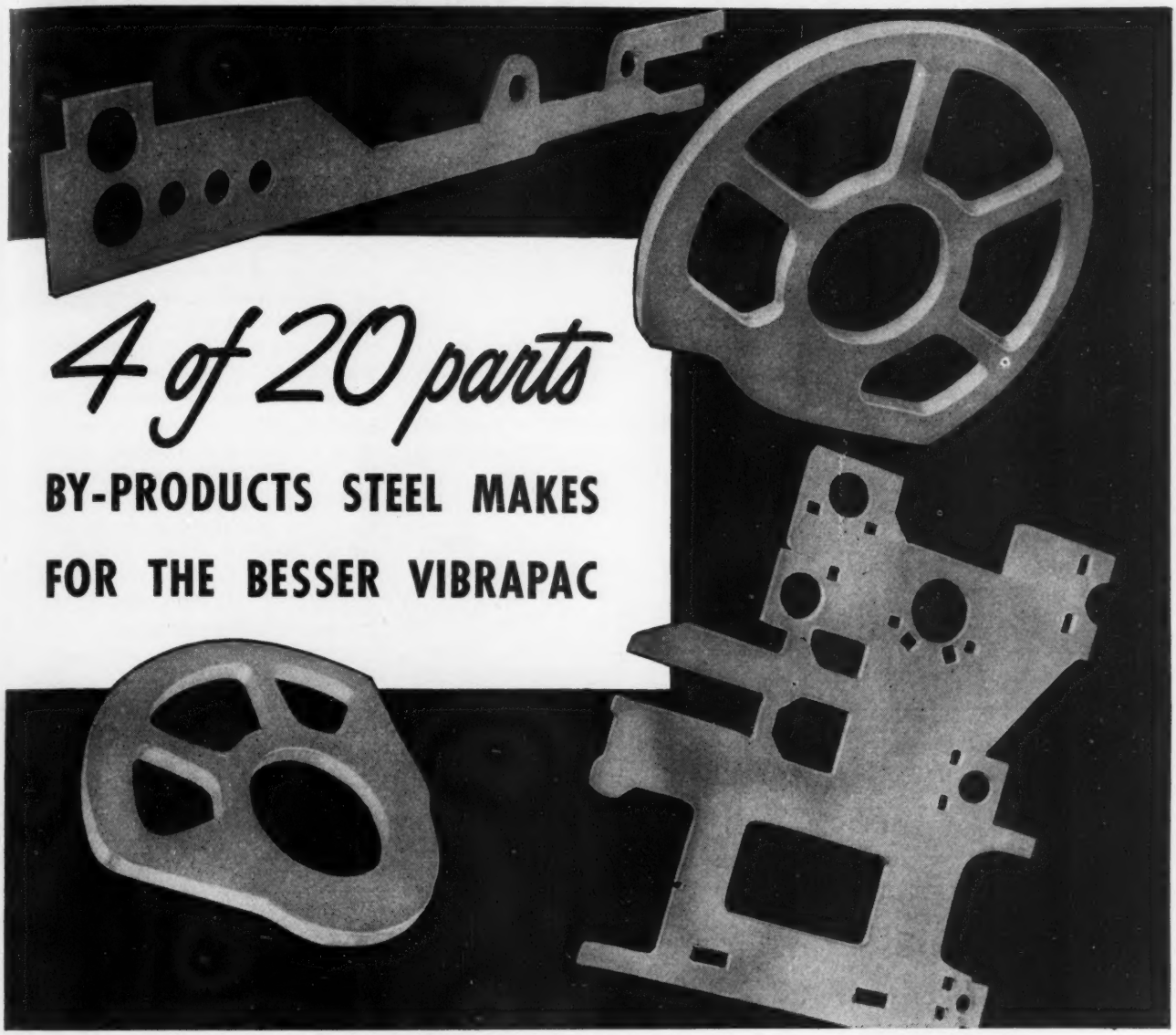
USE of electric power brushing has solved many finishing problems in fabrication of light metal parts. Wire wheel brushes made by Osborn Mfg. Co., Cleveland, have found many uses in plant of a railroad supplier for production as well as special jobs.

Typical application is the brushing air brake brass pistons, shown in the accompanying illustration. After cutting on a grinding wheel, pistons are brushed to form proper radii as well as for deburring rough edges. Long trim on this type of wheel permits wire to get down into irregular spots. About 1120 pistons are finished per 8-hour shift.

Roughening interior surface of aluminum cylinders, enabling them to hold lubricating fluids without disturbing close tolerances necessary to braking operation, is accomplished using a wire wheel brush with 3¼-inch diameter, containing 0.0095 wire and operating at 2000 revolutions per minute.

Power brushing is also used for deburring spring shafts and aluminum covers for steam compressor lubricators on a production line basis. Not only are burrs removed after milling operation, but an effective job is done of removing sand and other material from inside casting.





4 of 20 parts

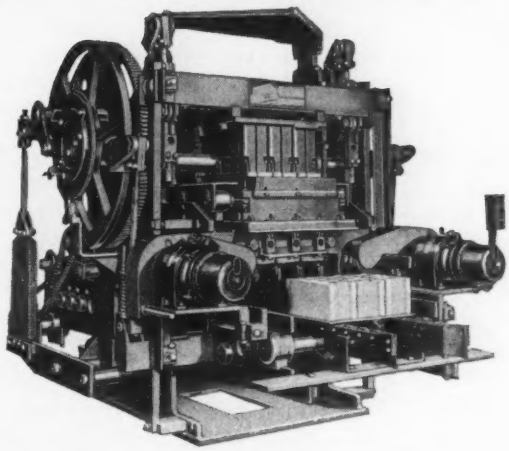
BY-PRODUCTS STEEL MAKES FOR THE BESSER VIBRAPAC

A pair of pallet conveyor bars, the machine's side frames, a half dozen different operating cams are typical parts By-Products Steel Co. supplies to Besser Manufacturing Company of Alpena, Michigan. Parts range in length from two to twelve feet, in thicknesses from 3/8 inch to over two inches.

Users of such steel plate products save hours of labor and machine work, and free their facilities for other production. By-Products Steel does the initial cutting out and forming operations, sending the scrap right to Lukens open hearths to speed the making of more steel. No prime material goes to the buyer's scrap pile. He saves on shipping and scrap handling costs.

By-Products Steel has more than 150 major machines for flame-cutting, shearing, pressing, blanking, bending or other steel shaping operations. We have thousands of dies ready for use, so can often save you the cost of new dies. Steel plate shapes are made from carbon, alloy and clad steels.

Bulletin 270 illustrates the wide range of shaping done in our plants. For a copy, or for a quotation on parts you need, write By-Products Steel Co., Division of Lukens Steel Company, 414 Strode Avenue, Coatesville, Pennsylvania.



This Besser Vibrapac produces 240 concrete or cinder building blocks per hour.

LUKENS
BY-PRODUCTS STEEL DIVISION

BY-PRODUCTS STEEL CO.

STEEL PLATE SHAPES

FLAME-CUT ★ SHEARED ★ PRESSED ★ BENT ★ BLANKED ★ WELDED

• • SPEED SCRAP TO THE MILLS TO MAKE MORE STEEL • •

Roll Life Increased 35%

...by controlled airless blasting

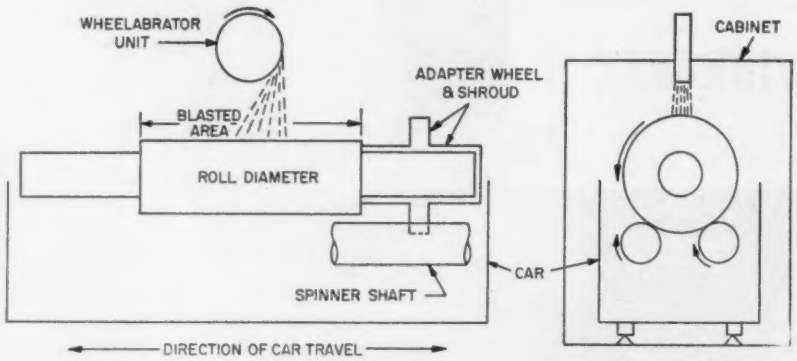
AS MANY as five rolls per hour may be dressed with a new type roll roughing machine developed recently by the American Wheelabrator & Equipment Corp., Mishawaka, Indiana. Employing a standard airless blasting wheel, the unit throws chilled iron abrasive, by centrifugal force under positive directional control, against the roll's exposed work surface. Actual blasting time requires about 2 minutes per roll.

The first machine of this type went into operation recently at the tin plate plant of Tennessee Coal, Iron & R. R. Co. in Birmingham, Ala., and it was found that average service life of the rolls increased 35 per cent over former roughing practice. This setup is presently dressing five rolls per hour.

Equipment consists of a special cabinet equipped with standard Wheelabrator unit, abrasive circulating and storage equipment, and special spinner car which supports and rotates the roll.

The roll to be roughened is placed on the spinner car at a loading station adjacent to the cabinet. It then moves, under its own power, to a position inside the cabinet where the blasting cycle is begun after cabinet doors are closed and auxiliary equipment put in operation.

By use of limit switch relays, spinning of the roll, movement of the car and flow of abrasive are controlled to afford an automatic operation, requiring no special operator skill or judgment and which can be reproduced consistently. Resultant roughening of the roll is extraordinarily deep and uniform regardless of schleroscope hardness.



Improved Synthetics Increase Hose Life

Buna and neoprene base synthetic hoses which stand up under punishment of high temperatures, pressures, vibration, corrosive solvents and fumes were recently developed by Ronaflex Tubing Co. Inc., Philadelphia. Standard couplings snap on and off, yet provide a tight positive grip that eliminates leaking joints without packing or tightening.

Tests in which new wire braided hose was constantly soaked by process oil, grease and grime show that it will last four times as long as previous models. Tubing 1/4-inch in diameter will withstand burst pressures up to 1000 pounds per square inch.

Plastic Sleeves Form Tough Insulating Coat

Plastic sleeves forming a tough, tight fitting insulation for magnetic coils have been developed recently by General Electric Co., Pittsfield, Mass. A sealing sleeve is slipped inside magnetic coil, the two ends are turned over outside, and sleeve is permitted to air dry. Use of sealing sleeves as an insulation enables many coils to be wound as one piece on long mandrels and cut to desired size.

Processing plastic sleeves calls for a special dilator solution developed by the company in which material is immersed for 2 to 4 hours. When expanded to half again its normal size, sleeve is placed in position. During the drying process it shrinks to less than original size forming a tight fit.

Telephone Relays Made By Multiple Broaching

Broaching of six telephone relay parts in a single pass with vertical press made by Colonial Broach Co., Detroit, produces 360 parts per hour to close tolerances and good finish. Machine is of 6 tons capacity and has a 36-inch stroke.

Hydraulically operated shuttle type fixture is interlocked with machine cycle. Clamping, loading and unloading are manual, but broaching and shuttling are automatic. Each of telephone relay parts has three series of cam shaped slots corresponding to the 10 numbers on a dial and accuracy requirements are quite high.

Rough stamping for impulse arc is blanked to 0.015-inch oversize on inside diameter and is then finish broached. In addition similar centering arcs are also broached. Major diameter of both arcs is 2.174 inches, minor diameter is 2.098 inches. Tolerance on the arcs, which are made of phosphor bronze 0.64-inch thick, requires that cam teeth surfaces be within 0 degree 3 minutes.

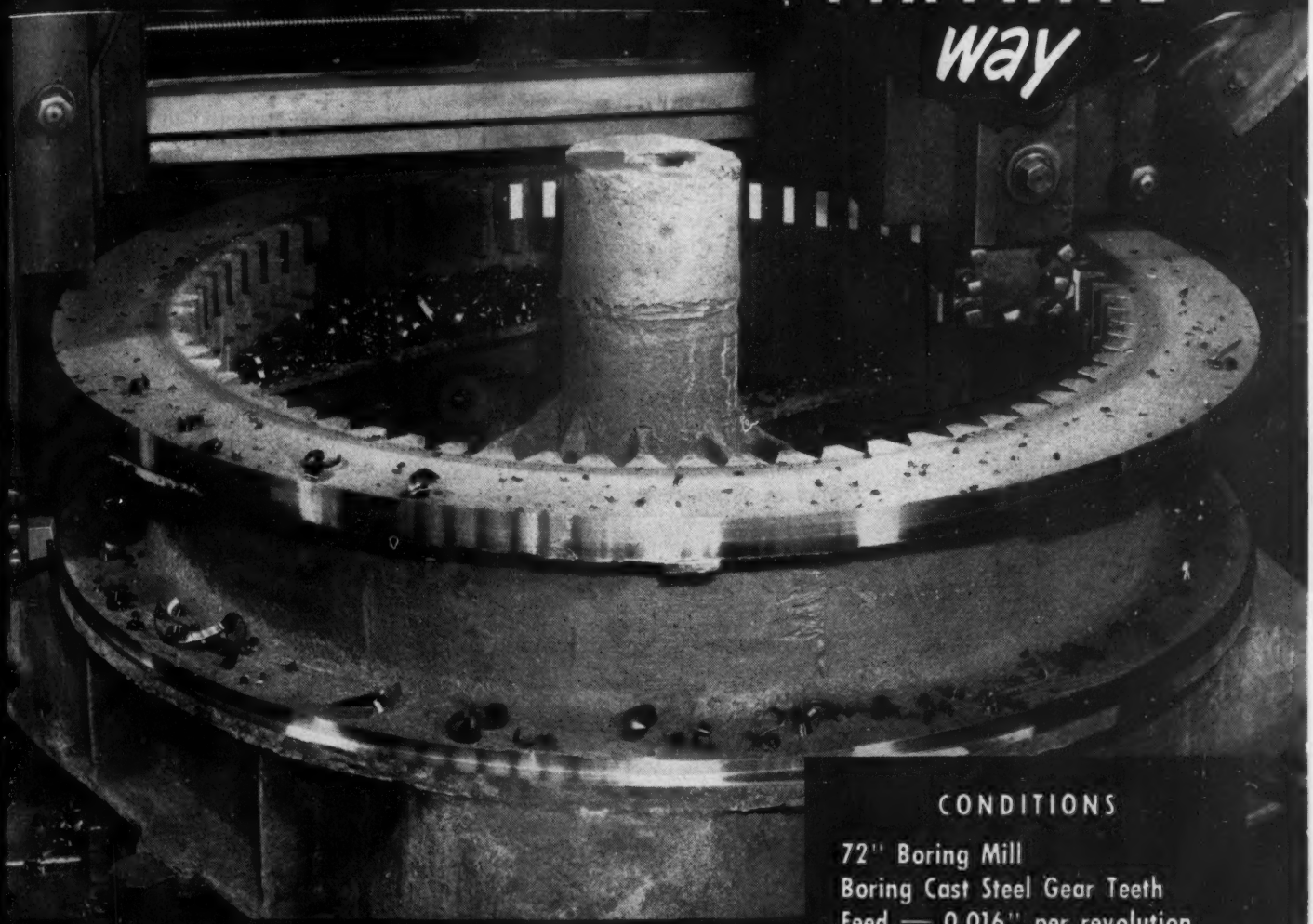
Slide Film on Ejector Type Tools Released

Recently completed by Super Tool Co., Detroit, is a slide film entitled "Advantages and Economies of Ejector Type Tools with Carbide Inserts." Film deals with features of both the horizontal type ejector tool in straight and offset design and vertical type with square, round, triangular and rectangular carbide inserts.

Ejector tool film is now available for showing before interested groups. If desired an engineer will be sent with projection equipment to make presentation and conduct question and answer period.

NEVER A DULL MOMENT

when you machine THE FIRTHITE way



CONDITIONS

72" Boring Mill
Boring Cast Steel Gear Teeth
Feed — 0.016" per revolution
Cut — 3/8"
Speed — 175 feet per minute
Grade of Carbide — Firthite TO_4

Firthite tools stay sharp longer
even on this severely interrupted cut
which might break ordinary carbide tools.
Let us help you select the best Firthite grade for your "Problem Job."

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IN CANADA CHAPAT ENGINEERING & SALES LTD.

INDUSTRIAL POWER CONSUMPTION

...expected to rise as equipment becomes available

POWER consumption per industrial worker has increased 120 per cent in the last 20 years because of the need for higher efficiency in production, and industrial power requirements will continue to rise as equipment becomes available, stated F. R. Benedict, manager, industry engineering, Westinghouse Electric Corp., Pittsburgh, at Midwest Power Conference in Chicago, April 7. Each industrial worker is backed up by 7.2 horsepower of which figure 93 per cent is electric power.

Because of the high level of power already behind the worker, any new power use must be justified in terms of cost, quality and quantity of the manufactured product. Determination of these factors is a complicated engineering problem and requires thorough study and evaluation of every manufacturing detail to determine whether the desired results can be obtained.

With the greatly increased costs of labor, industry is looking with great favor upon the application of highly specialized automatic machinery in industrial processes. Introduction of expensive machinery that turns out increased numbers of pieces at lower costs always requires intense worker education because the worker thinks of the temporary decrease in manual labor required.

Resistance Welding Increases—Development of precision controls in resistance welding in recent years enabled the method to be used for welding aluminum, magnesium, stainless and hardenable steels instead of being confined to the lower carbon steels. The basic reason use of the method is expanding is that it is a time saving joining method which is particularly adaptable to high production manufacturing. About 1 million kilovolt amperes of this type of equipment are already in service but metal fabricating industries alone have a potential of over three times this amount which could be reached quickly if fabrication materials became plentiful. While this load is intermittent and high, it is a most important one to industry.

Electric furnace brazing methods developed during the war can be very well integrated into peacetime manufacturing operations. As these furnaces are usually worked on a continuous basis, they provide uniform loads that are very attractive. Industry has already installed about 50,000 kilowatts of these furnaces and can readily absorb two or three times this amount.

Infra-red heating has not yet reached its proper stature in the industrial field in spite of the fact that the unit is in the form of a lamp with a low initial selling price and requires only moderate additional equipment for application. Infra-red heat is versatile and can be used for drying many materials such as paints and varnishes in all industries.

Continuous Annealing — Considerable interest is being shown in the continuous annealing of metal products of all types. After a certain amount of cold work is done on the material, it must be annealed before it continues through its process sometimes as often as five times. If this annealing could be done on a continuous basis, it would eliminate many handling operations. Induction heating, using frequencies from 60 to 200,000 cycles, is being investigated and may find wide use in industrial processes within the next few years. Power consumption of such equipment will be high, possibly as much as 5000 kilowatts per unit and will be a continuous type of load. The steel industry alone could absorb 1 million kilowatts of this type of heat in a relatively short time.

Approximately 3 million kilowatts of electric furnaces are installed in the United States at present and the figure is growing rapidly. This type of furnace is ideal for making high-quality steel, and with the growing use of alloys it is due for considerable expansion in the future. If our steel consumption continues to increase, there is a capacity in this field approaching 500,000 kilowatts per year.

Resistance Furnaces — Resistance furnaces with controlled atmosphere were used in large numbers during the war for continuous furnace brazing, annealing, and heat treating of all types of metal products. Largest user was the aviation industry, although the iron and steel industry was a close second. Absorptive capacity for this equipment is very high in industry, but here again a high degree of technology is necessary in making the application.

It is estimated that industry can very well absorb 50,000 kilowatts of this type of furnace equipment a year.

Radio frequencies from 200,000 to 450,000 cycles are used in the brazing and hardening field for small metal parts. In addition approximately 10,000 kilowatts of RF heating at 200,000 cycles have been reflowing tin since 1943. If high output tubes in the order of 500 kilowatts can be commercially developed, this type of heating will be attractive in the continuous annealing fields.

Factory Lighting—It is conservatively estimated that 125,000 factories are underlighted both in their offices and in their shops. This story must be brought to industrial customers on an engineering basis, as an antiquated lighting system often results in the feeling that "what was good enough for grandpa is good enough for me." While fluorescent lamps give 2-1/2 times the amount of light for the same watts, industry must be sold on the idea of increasing light levels at least four times over present levels for high worker efficiency.

Development of ore beneficiation industry will require tremendous amounts of power, as every pound of ore will have to be handled many times in the process. Conservative estimates place the requirements for power of this industry at 1 million kilowatts. Rapid expansion of the industry will present many problems as most of the areas are not highly electrified and generation, transmission and distribution facilities will have to be matched with utilization as it develops.

Aluminum industry development during the war was amazing not only in the speed with which it was accomplished but also in the amount of rectifiers absorbed. Aluminum and magnesium production slumped off rapidly at the end of the war due to the closing of many of the high-producing aircraft plants, but now the industry is nearly up to wartime capacity. Our industrial designers are just beginning to recognize the very real advantages of aluminum and this industry is expected to continue at high capacity. About 1-1/2 million kilowatts of rectifiers are installed in the aluminum industry today and this could very conceivably double within the next 10 years.

Industry is continually calling for increased amounts of power, and we earnestly hope it can be supplied to everyone who desires it. Past de-

The WEAN ENGINEERING CO., INC.
WARREN, OHIO

SPECIALISTS IN SHEET, TIN AND STRIP MILL EQUIPMENT

Products

Continuous Strip Coiling Equipment
Special Conveying Mechanism
Automatic Pilers
Uncoiling Units
Press Feeding Equipment
Slitters
Strip Uncoiling and Automatic Shearing Units
Strip Coil Holders
Strip Coiling Reels
Sheet Galvanizing Equipment
Automatic Tinning Equipment
Equipment for Chemically Treating Tin Plate
Automatic Doublers
Normalizing Furnaces
Continuous Strip Pickling Equipment including: Uncoilers, Up-Cut Shears, Stitching Machines, Pinch Roll Units, Recoilers, Drying Machines, Pickling Tanks and Auxiliary Equipment
McKay Levellers and Processing Units
Strip Welding Equipment
Scrubbing, Leveling and Oiling Machines for Flat Products
Annealing Furnaces
Corrugated Inner Covers
Automatic Feeding and Catching Tables
Continuous Pack and Pair Heating Furnaces
Wheelabrator Abrasive Cleaning Equipment
Automatic Weight Classifier
Automatic Gauge Classifier
Shell Lathes
Airplane Motor Sleeve Lathes
Armor Plate Levellers
Vacuum Cup Lifters
Electrolytic Tinning and Galvanizing Equipment
Narrow Strip and Wire Mill Machinery

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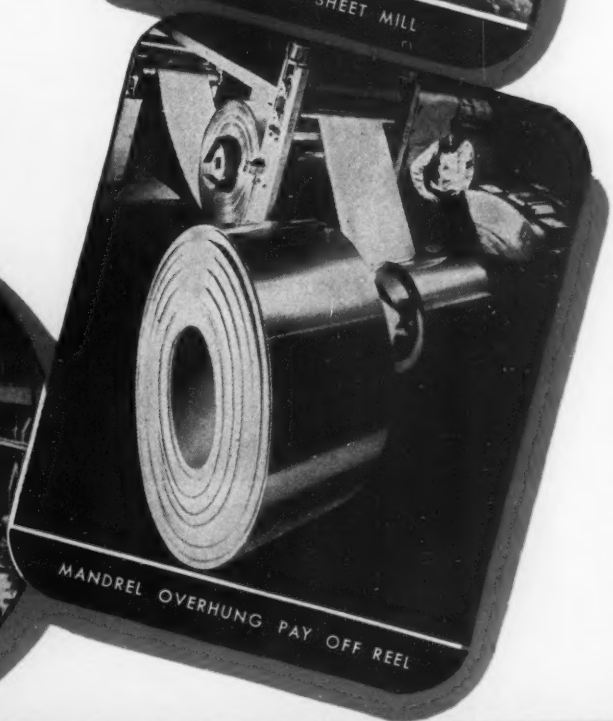
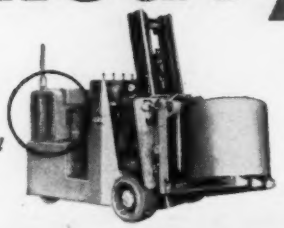
SLITTING LINE

ANNEALING

MECHANIZED SHEET MILL

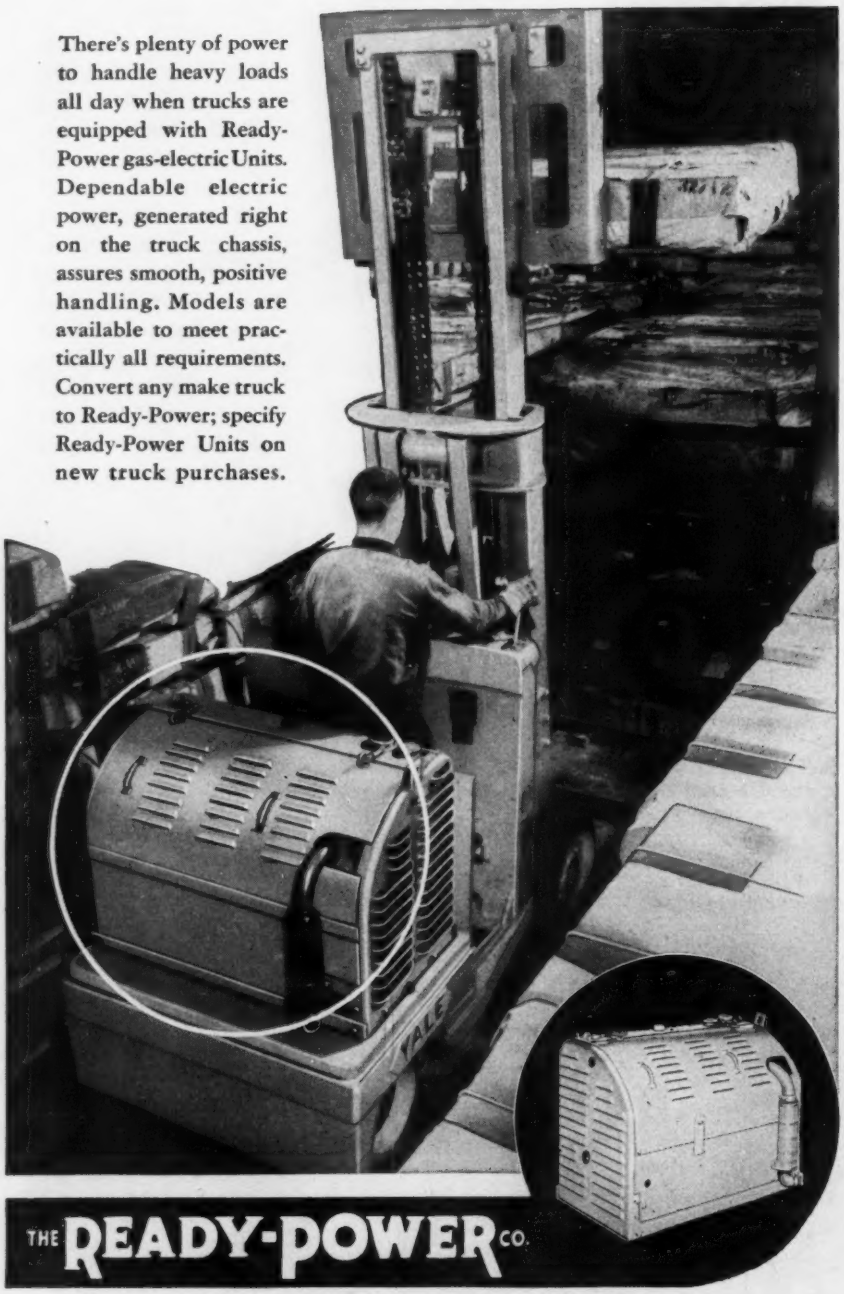

MANDREL OVERHUNG PAY OFF REEL

heavy loads need READY-POWER



Ready-Power-equipped Baker truck

There's plenty of power to handle heavy loads all day when trucks are equipped with Ready-Power gas-electric Units. Dependable electric power, generated right on the truck chassis, assures smooth, positive handling. Models are available to meet practically all requirements. Convert any make truck to Ready-Power; specify Ready-Power Units on new truck purchases.



THE READY-POWER CO.

3824 Grand River Ave., Detroit 8, Michigan

mand has been largely unpredicted, and as a result reserves are slowly dwindling. There are those who are wondering whether the consumption and production lines will cross. There are two primary reasons why they have not crossed up to now. The first is interconnection of large power systems that has made it possible to supply maximum demands imposed on the system by exchange of power. The second is the present shortage of materials which has limited industrial production. This natural brake on the use of power is beginning to be released though, and the situation must be watched carefully.

Railroad Inspection Conference Scheduled

Railroad inspection with Magnaflux and Zyglo will be discussed in a conference scheduled by Magnaflux Corp., Chicago, for April 12 and 13, 1948. No time will be devoted to lectures on theory and mechanics of these methods since the conference is designed for operating executives, superintendents, engineers, master mechanics and shop foremen. If there is sufficient interest, however, lectures on theory will be offered in the evening of the second day.

Standardized Containers Reduce Shipping Costs

Integration of shipping operations in order to effect savings and insure accurate delivery of goods in an attractive container that "sells" is the goal achieved by Wausau Motors Parts Co., Wausau, Wis. Investigation revealed that a fiber carton and a wooden box would take care of most shipments so these containers with the company's address and trademark imprinted thereon have been adopted as standard.

Stencils were selected as the means for addressing the cartons to keep up appearance of container and to provide permanent legible addresses. Stencils are cut on machines made by Marsh Stencil Machine Co. Belleville Ill. and are reused for subsequent shipments. Stencils on file gives the company a complete list of customers' addresses and also provides savings in time.

—o—

Contact tip brazing with a 20 kilowatt induction heater using a two position radio frequency power transfer switch was demonstrated by Allis-Chalmers Mfg. Co., Milwaukee, at the Chicago Production show.

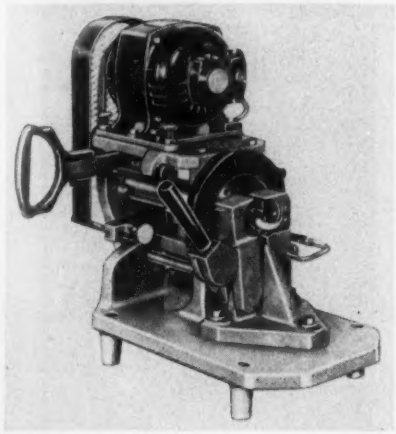
New Products and Equipment

Additional information on the new products and equipment described on this and succeeding pages may be obtained, without obligation, by checking appropriate numbers on the cards following page 134

1. Flaring Machine

Tube cutting and flaring are simplified and speeded up by improvements in an electric machine, developed by C. J. Unger Mfg. Co., Dayton, O. The machine cuts, flares and trims copper or aluminum tubing in one operation and is capable of performing 5000 flares in 8 hours.

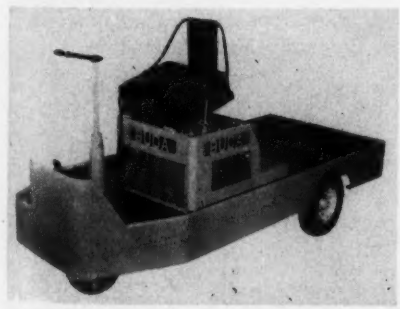
By installing a wedging mandrel in place of the flaring mandrel, stand-



ard swedging operations can be performed. As tubing does not turn, the machine will handle any length of tubing in sizes from 1/4 to 3/4-inch outside diameter. Leaks caused by crystallization of metal are eliminated as machine spins and trims both flares and swedges to a perfect fit. Power is furnished by a 1/3-horsepower motor.

2. Platform Truck

Platform truck with 2000 pounds capacity, the model FH Chore Boy, has been improved by its manufacturer, Buda Co., Harvey, Ill., for less than car load freight, car shop and stores

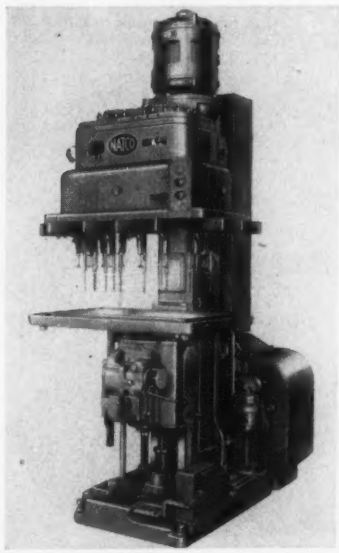


work. This type of work is handled easily with the truck's heavy construction and its 2 cylinder, 10 horsepower Onan gasoline engine which gives speeds up to 12 miles per hour.

Deck loading area is 20 square feet. Driver's seat is offset to facilitate handling of long material. It has an outside turning radius of 7 feet, permitting maneuvering in narrow aisles and in box cars. Both 16 x 4 inch pneumatic and puncture proof cushion rubber tires are available on demountable rims.

3. Driller and Tapper

Furnished as a driller only, a tapper only, or as a combination driller and tapper, the heavy duty and light duty model H-5 and H-6 multispindle machines, built by National Auto-



matic Tool Co., Richmond, Ind., perform high production small parts work in steel, cast iron, plastic or wood. Replacing models G-5 and G-6, the machines vary only with regard to size of drilling area of head, horsepower of head drive motor, number of spindles in head and size of work table.

Spindle speeds are varied by change gears and a quick change speed mechanism. Vertical adjustment on spindles compensates for different drill lengths. Spindles have a reversing motor drive for tapping operations. Large table may be arranged with either a combination hand and foot feed or a hydraulic power operated feed (illustrated). Model H-5 has a 7 x 12-inch drilling area head and has twelve ¾-inch diameter upper joint drives while model H-6 has a 10 x 24-inch drilling area head with twenty-four ¾-inch diameter upper joint drives. Machines may be arranged with a slip spindle plate and slip type spindles.

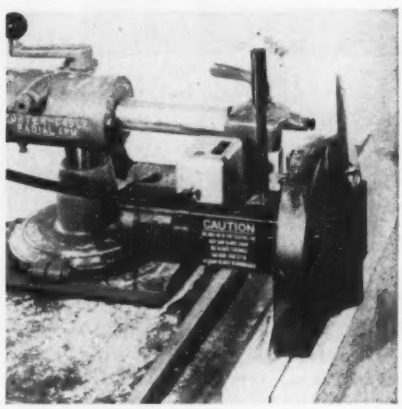
4. Power Positioner

Power unit employed for positioning accurately over small distances in accordance with received pneumatic pressures is the Micropositioner now being manufactured by Hagan Corp., Pittsburgh, Pa. Employing a pneumatic pressure of 60 pounds per square inch, unit can position a lever within a few thousandths of an inch over a range of 0 to 0.5-inch working directly without use of mechanical linkage.

Device is suited for positioning of oil burner tips, injection nozzles, governor gear on boiler feed pumps, or other applications requiring precise positioning.

5. Radial Saw

High speed radial saw model Rs, made by Porter-Cable Machine Co., 1714 North Salina St., Syracuse 8, N. Y., is designed for heavy industrial use and is powered by a compact, light weight motor of either 1 or 2-



horsepower. The motor operates on alternating or direct current of 25 to 60 cycles with a spindle speed of 8000 revolutions per minute, the high speed making fast, smooth and clean cutting possible.

The 12-inch saw blade cuts a full 4 inches. Saw is adaptable for cross cutting, gang cutoff, angle cutoff,

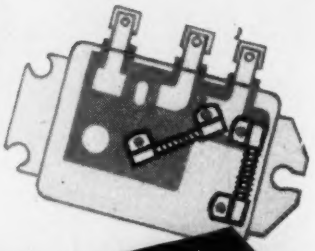
TAYLOR MADE by TAYLOR-WINFIELD

Automatic Production

with

RESISTANCE WELDING

(Left) 10 station, dial feed, T-W Series Projection Welder.
(Below) Voltage regulator sub assembly showing two resistors welded in position.



Up to 7200 Welds Per Hour

THE PRODUCT—Voltage Regulator, sub assembly.

THE PROBLEM—To attach two resistors on under side.

TYPE OF WELDER—10 station, dial feed, double dual head, T-W Series Projection Welder, with automatic mechanical ejector.

PROCEDURE—Operator loads assembly and places resistors in position, then welder takes over. Fingers automatically position parts for welding. After welding, a mechanical pick-off (air cylinder operation) places welded assembly on conveyor belt. Complete operation is automatic from time of loading to ejection.

RESULTS—Production, 7200 welds per hour.—(4 welds simultaneously.)

COMMENT—On small or large parts, resistance welding is a fast, sure method of joining metals. Taylor-Winfield makes all sizes and styles of resistance welders, including spot, projection, seam, and flash-butt. If you have a joining problem, T-W can help you.

Our monthly publication "Weld-It" shows many production short cuts by resistance welding. Request it using your company letterhead.

THE TAYLOR-WINFIELD CORPORATION
WARREN, OHIO, U.S.A.

TAYLOR-WINFIELD
RESISTANCE WELDERS

bevel cutting, dado cutting, etc. Motor is set vertically to accommodate cope heads, shaper heads, dado saws and groovers. It can be set at any angle and it has a 27-inch stroke.

6. Air Presses

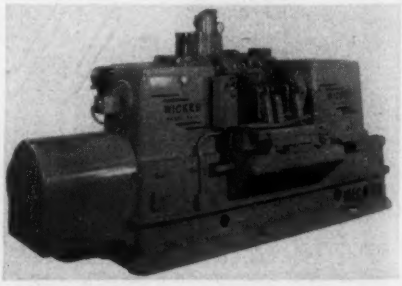
Two hundred strokes per minute are delivered by new air presses of 1/2, 1 and 2-ton capacity, built by Munton Mfg. Co., Franklin Park, Ill., for such applications as riveting, cutting, drawing light metals and forming. Presses are built to stand up under

high speed operation by virtue of all welded construction with ample provision for overloads.

Features include two-way cylinders with cushioned top and bottom and ram guide manually operated by hand lever. It is readily mounted on any bench. A stand and foot control can be furnished. Other available attachments are a silencer, speed regulator and stroke control.

7. Turning Machine

All carbide turning tools are used in the double end drive crankshaft turning machine for high speed operation, a development of Wickes Brothers, Saginaw, Mich. Machine is ar-



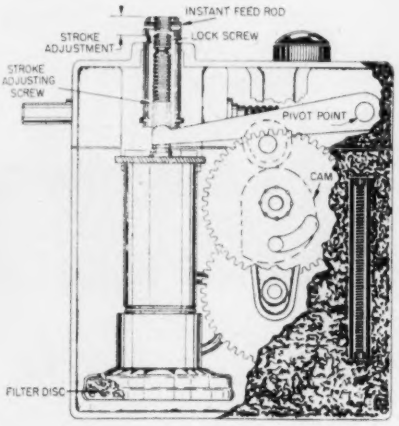
ranged for the operation of rough and finish turning of outside diameter of the six counterweights as well as rough and finish turning of clearance

chamfers on the six crankarms simultaneously of a four-throw, five bearing V-8 type crankshaft.

Machine is completely automatic and capable of producing 35 crankshafts per hour net. It is provided with front and rear cam-operated angular cross slides mounted in the back tool housing. Hydraulic feed is provided to all tool slides. A 40 horsepower main drive motor powers the machine.

8. Automatic Lubricator

Completely automatic, the type M lubricator, a development of Bijur Lubricating Corp., 43-01 Twenty-Second St., Long Island City 1, N. Y., can effectively oil up to 100 bearings with measured regularity. Unit develops

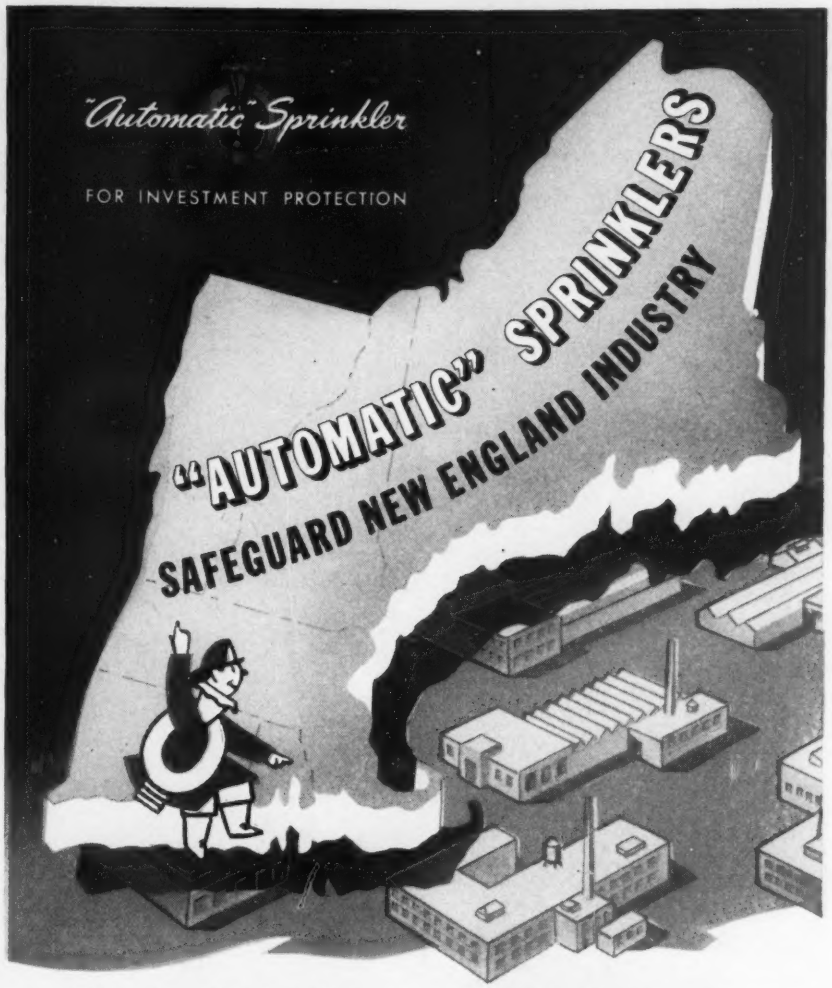


an average discharge pressure of 40 pounds per square inch and discharges from 2.5 to 5.5 cubic centimeters (adjustable) at each pump impulse.

Lubricator is driven from a rotating machine shaft, either directly or by belt or gear drive of suitable ratio. Power requirements approximate 0.001-horsepower. It is offered with several reduction ratios and in both right and left hand drives. It is a two-part mechanism, with a lubricator mounted directly on a reservoir. Pump unit may be mounted in a built-in reservoir integral with machine to be lubricated or furnished complete with standard reservoir.

9. Hand Truck

A variety of small loads may be handled by the adjustable length hook-equipped Easy-Tote departmental truck, manufactured by Easy-Tote Products Co., P. O. Box 86, Buffalo 17, N. Y. By setting hook to required length, load may be engaged, easily cranked onto baseplate and automatically deposited over axle, at which point hook falls free. In this balanced position a slight forward



They're Protection . . . They're Savings . . .
They Should Be A Part Of Every Business!

Industrial and commercial fire safety has been and must continue to be an important function of business, not only in New England, but everywhere. With modern methods of protection, loss of life or cessation of manufacturing and selling operations because of fire is inexcusable.

"Automatic" Sprinkler systems have past proved their fire combatability. They stand ready at all times to give instant, effective action at the first indication of flame. Because of this speed of detection, fires in sprinklered properties are usually extinguished in their infancy with but few sprinklers in actual operation, hence, little or no water damage.

While the element of protection must always be considered of primary importance, approved "Automatic" Sprinkler installations realize at once a savings of upward to 90% in insurance premiums . . . concrete evidence that continues to make "Automatic" Sprinklers *an important investment today . . . perhaps welcomed protection tomorrow.*

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DEVELOPMENT · ENGINEERING MANUFACTURE · INSTALLATION
"AUTOMATIC" SPRINKLER CORPORATION OF AMERICA
YOUNGSTOWN 1, OHIO
OFFICES IN PRINCIPAL CITIES OF NORTH and SOUTH AMERICA

Extra Wide Face Gears

GUARANTEE LONG LIFE

. . . just one of the ten points of superiority of Horsburgh & Scott single, double and triple reduction Herringbone Speed Reducers . . . in ratios from 2.31 to 1 up to 429 to 1.

● These features insure quiet, smooth operation with maintenance cost close to the zero point and exceedingly low depreciation, even under very heavy shock loads and other difficult conditions of service.

Send note on Company Letterhead for Speed Reducer Catalog 46

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

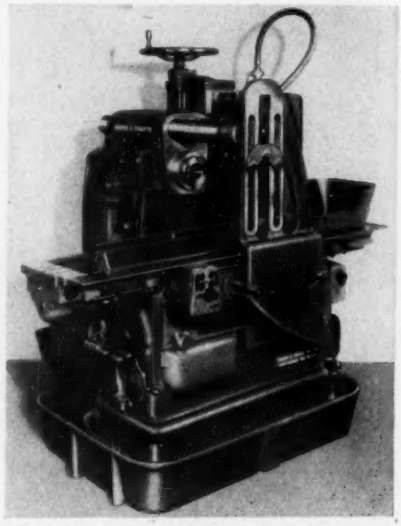
5112 HAMILTON AVENUE • CLEVELAND 14, OHIO, U. S. A.

tilt of the rigid handle slides load smoothly to floor.

One person can handle loads up to 400 pounds with safety and without injury. Truck may be equipped with antifriction semisteel wheels or rubber wheels. Three wheel arrangement with swivel caster permits short radius turning.

10. Milling Machine

Electrically controlled, the 7-1/2-horsepower spindle drive No. 12 plain milling machine, built by Brown & Sharpe Mfg. Co., Providence 1, R. I., is powered for heavier cuts, with ample capacity for many moderate sized carbide milling jobs. Its power is ap-



plied through a separate spindle motor. Machine had 21 spindle speeds in either direction plus 24 intermediate speeds and 28 separate rates of feed. Sixteen rates of table feed can be automatically doubled at any point in the cutting feed.

Automatic table reverse in cutting feed with table continuing in cutting feed in opposite direction permits rough and finish milling at one loading of the work, using dual feed rates if desired. Climb milling in either direction can be used up to driving motor capacity. Double milling fixtures may be used.

11. Tank Conveyor

Collection, transportation and discharge of solid or fibrous materials which settle to the bottom of tanks or hoppers are the operations performed by the Houdaille continuous conveyor, a product of Honan-Crane Corp., Lebanon, Ind. Settled material is picked up by steel-backed neoprene rubber flights mounted on an endless link chain and transported through a 4-inch pipe to a hopper

"Him say: 'For help with plating, call Du Pont Technical Service.'"

WHATEVER YOUR PLATING PROBLEM, DU PONT TECHNICAL SERVICE OFFERS QUICK, EFFICIENT HELP

Problems are bound to crop up occasionally, even in the best regulated plating operations. And when they do, you can count on Du Pont to work closely with you, to help you find a quick solution.

Whether your problem is large or small, Du Pont has the experience and "know-how" to provide you with valuable advice and assistance. Just call or write the nearest Du Pont office. You'll get competent help from men who are thoroughly familiar with electroplating. And Du Pont Technical Service Men are backed up by Du Pont research and laboratory facilities.

Practical operating manuals giving detailed information on the efficient, economical use and application of Du Pont materials and plating processes can be obtained by sending a letter or by telephoning the nearest district office.

E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Wilmington 98, Delaware.

DISTRICT OFFICES: Baltimore, Boston, Charlotte, Chicago, Cincinnati, Cleveland, Detroit, El Monte, California, New York, Philadelphia, Pittsburgh, San Francisco.

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DU PONT *Chemicals • Processes • Service*
for **ELECTROPLATING**

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

where it is discharged into a cart for disposal.

Pipe casing may be flanged at any point to facilitate opening for inspection. Bends are made to conform with any desired traverse. Chain is drop forged and heat treated, made of high carbon steel and pin connected. Drive is by high torque gear transmission enclosed in an oil-tight gear case. Capacity of conveyor is directly proportionate to speed of chain.

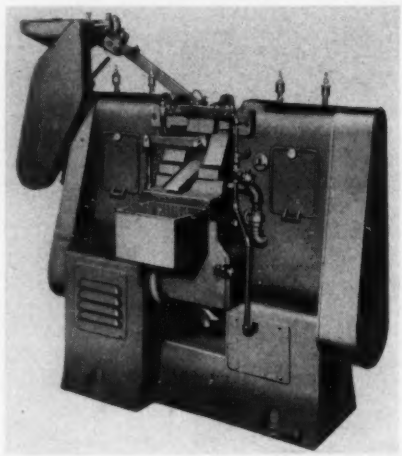
12. Vibration Dampers

Machinery vibration can be isolated with vibration dampers made by Finn & Co., 2850 Eighth Ave., New York 30, N. Y. Type CM-H mount is for rotary and horizontal vibration and type CM-V is for vertical vibration in top heavy and recoil type machines. Design involves no rubber to metal bonds that may break or separate in use. Synthetic rubber inserts are held firmly in place by steel retaining brackets and are impervious to oil, water, sunlight, greases and cleaning solvents.

Horizontal mounts are designed for use under machinery like precision grinders, lathes, generators, pumps, compressors and job borers. Vertical mounts are designed for use with machinery such as punch presses, shears and tank mounted air compressors.

13. Drilling Machine

Applicable to a variety of drilling problems such as drilling of cotter pin holes in screws and bolts, the duplex horizontal drilling machine, built by



Kent Machine Co., Cuyahoga Falls, O., is available for full automatic, semi-automatic or hand feed. With a hopper one attendant can keep a battery of machines in operation.

Work is held rigidly by two grip jaws fitted with bushings to guide drills. Drills enter from opposite side of work simultaneously and proceed to a point near center. One drill is withdrawn and the other completes the hole. Drilling speed of spindle and depth of hole can be varied independently. Maximum drill diameter in steel or cast iron is 316-inch. Maximum part length with hopper feed is 2-1/2 inches.

14. Plating Rectifier

Specifically designed for barrel plating, a selenium rectifier made by Bart-Messing Corp., 45 Morgan Ave., Brooklyn 6, N. Y., has a full load operating efficiency of 77 per cent and is capable of operating one or more barrels depending on size and load. Selenium stocks have 310 square inches of rectifying area per 100 amperes (a total of 2235 square inches) and are heavily coated for corrosion resistance. Safety factors include magnetic contactor to protect line in case of short in tanks, circuits for extra safety as overload protection in direct current and automatic recti-

(For more information, use the card following page 134.)

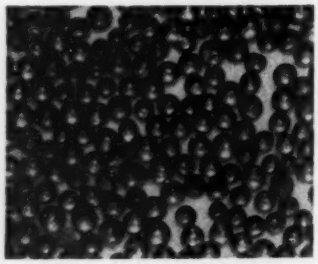
ACCEPTED
BY AMERICA'S LARGEST INDUSTRIAL PLANTS TO DO THE TOUGHEST BLASTING AND PEENING OPERATIONS

HI-GRADE METALLIC SHOT AND GRIT

FAMOUS
FOR ITS ABILITY TO STAND UP UNDER REPEATED HARD USE

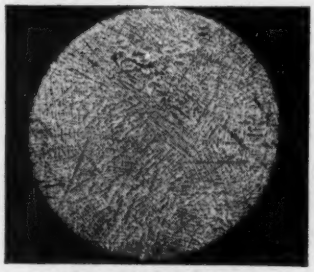
- ROUND
- UNIFORM IN SIZE
- UNIFORM IN HARDNESS
- LACKS IRREGULAR SHAPES

- RECTANGULAR
- SHARP
- TOUGH
- DURABLE



UNRETOUCHED PHOTO OF HI-GRADE SHOT

CLAYTON-SHERMAN ABRASIVES COMPANY
3896 LONYO ROAD
DETROIT 10, MICHIGAN
CEdar 7200



MICROSCOPIC STRUCTURE OF METAL

When You Need MORE CORROSION RESISTANCE in Handling Sulphuric and Many Other Acids—

Use the NEW *Carpenter* STAINLESS NO. 20

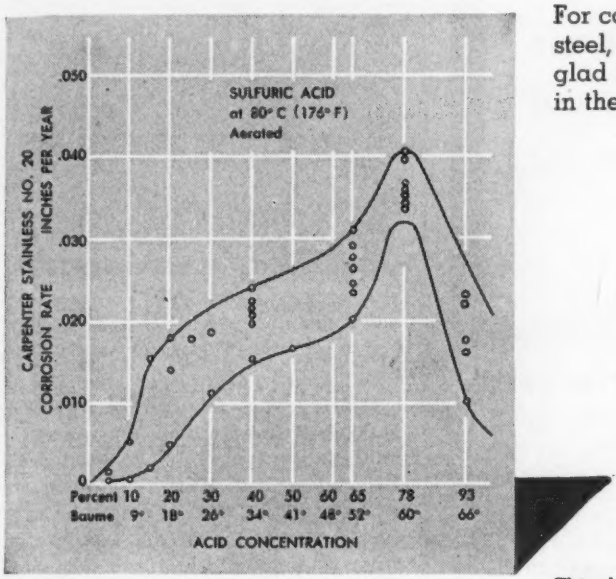
For an Extra Margin of Safety!

For the first time, this Stainless is available in the forms of bars, wire, strip and tubing.

If you are familiar with this alloy in its cast form, known as Durimet 20, you have a good idea of the corrosion resistance provided by Carpenter Stainless No. 20. Now that Carpenter's research has solved the problem of producing this Stainless in wrought forms, the material can take on new and important jobs.

In addition to its excellent resistance to sulphuric acid, Carpenter Stainless No. 20 is well suited for the handling of other acids and corrosive agents. For example, it is used in the handling of acetic, nitric and crude phosphoric acids, black liquor, calcium phosphate, etc.

For complete information on the properties of this new Stainless steel, drop us a note on your company letterhead. We will be glad to put a set of Carpenter Stainless No. 20 Data Sheets in the mail for you.



This chart shows the ability of Carpenter Stainless No. 20 to resist the corrosive effects of sulphuric acid at temperatures of 80°C (176°F). The danger zone, indicated by the "hump", is in the range of 65-93% sulphuric acid at 80°C (176°F). In this range the conventional 18-8 Cr-Ni-Mo austenitic steels (Types 316 and 317) show corrosion rates many times greater than illustrated here. While Carpenter Stainless No. 20 shows accelerated corrosion, it is far superior to the 18-8 grades and is satisfactory for most of this concentration range.

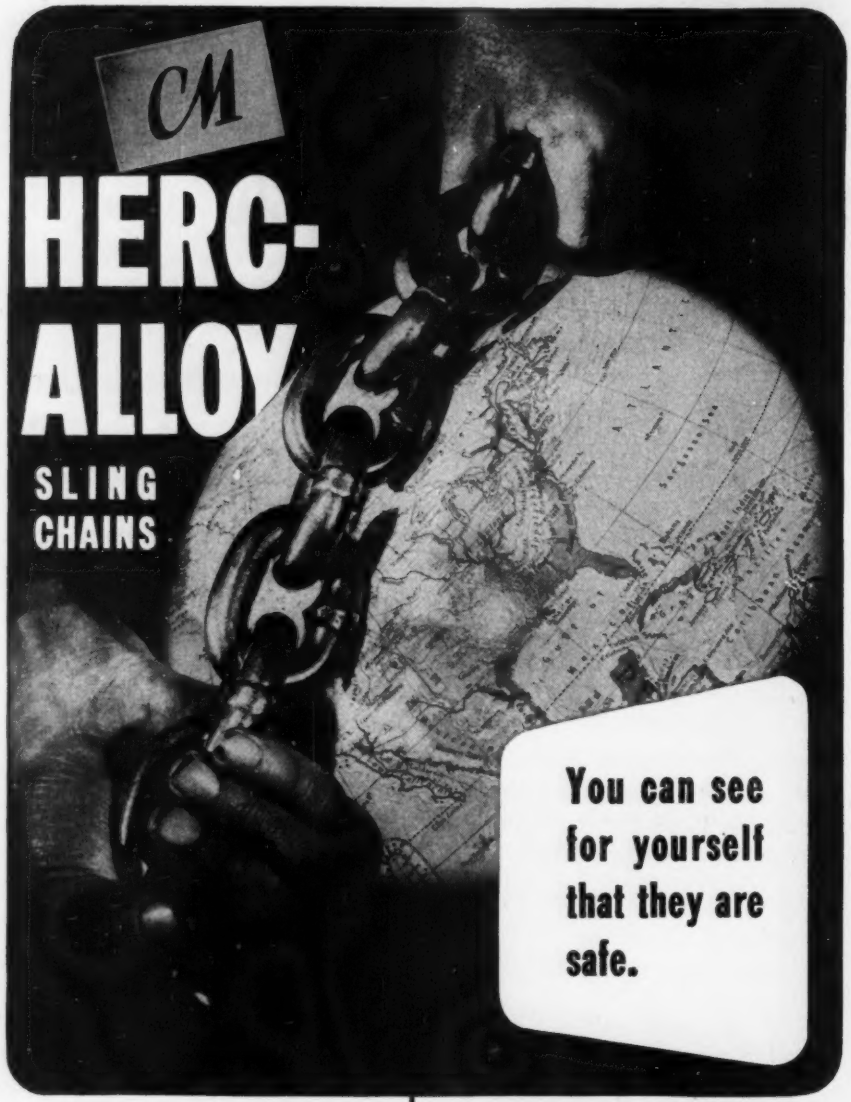
THE CARPENTER STEEL COMPANY

139 West Bern Street, Reading, Pa.

Carpenter

STAINLESS NO. 20

Licensed under patents of The Duriron Co., Inc.



● Just one of the big advantages of HERC-ALLOY Sling Chains is that you can determine their serviceability by a simple visual inspection.* Ordinary steel or iron chains, on the contrary, grow dangerously brittle with age... an insidious threat to the safety of men and materials. That's why more and more of the important companies are standardizing on HERC-ALLOY Sling Chains... because you can see for yourself that they're safe.

*Write for your copy of this new, informative booklet. No charge.

HERC-ALLOY FEATURES

- America's *first* alloy steel sling chain... first to bear a serial number.
- *Every* CM HERC-ALLOY Sling Chain is alloy steel throughout... links, rings, hooks. There is only one grade... *the best.*
- Every chain is individually tested and accompanied by a certificate of registration.
- Links are side welded for maximum strength by patented INSWELL electric method.
- HERC-ALLOY Chains should *never* be annealed.
- HERC-ALLOY Chains are lighter... stronger... easier to handle... outlast ordinary chains 4 to 5 times... cost less on the job.

HERC-ALLOY... the chain you can *SEE* is safe

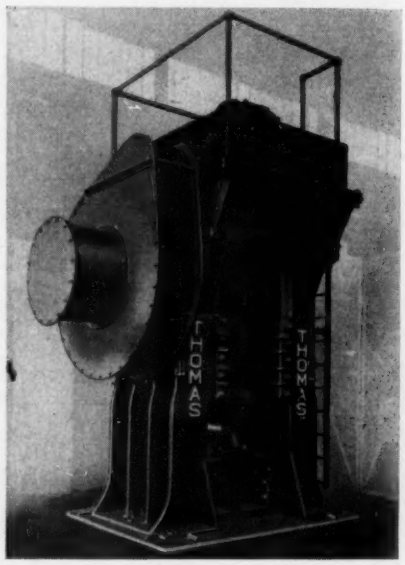
COLUMBUS-McKINNON
CHAIN CORPORATION
(Affiliated with Chisholm-Moore Hoist Corporation)
GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.
SALES OFFICES: New York • Chicago • Cleveland • San Francisco • Los Angeles

fier shutoff if air intake is blocked.

Rectifier operates on 3 phase 60 cycles with input voltages either 200-220 volts or 400-440 volts. Doors have quick acting fasteners for easy removal. Weston meters and shunts are used exclusively.

15. Billet Shear

All gears and the motor drive of the billet shear announced by Thomas Machine Mfg. Co., Pittsburgh 23, Pa., are overhead and all moving parts are enclosed, resulting in considerable floor space economy. Such an arrangement also means greater accessibility and a heightened operator safety factor.



Construction features include all cast steel housing, an air operated multiple jaw type clutch and cast steel herringbone cut gears running in an oil bath. The 1200 ton machine illustrated is used to obtain test pieces from rollings of structural shapes.

16. Speed Reducer

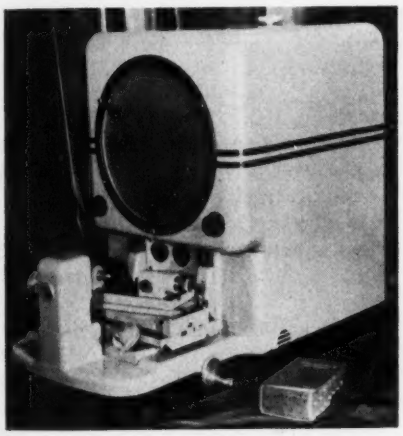
Seven-inch center distance speed reducers, made by Cone-Drive Division of Michigan Tool Co., Detroit 12, Mich., are offered in 10 standard ratios ranging from 5:1 to 70:1. Designated as series 7700, the line is available in three types: HU-7700, with pinion under the gear; HO-7700, with pinion over the gear; and HV-7700, with gear shaft vertical. All ratios and types are also available with double extended gear shafts or double extended pinion shafts.

Reducers have mechanical horsepower ratings ranging from 1.56 horsepower at 100 revolutions per minute for the 70:1 ratio to 94.2 horsepower at 2400 revolutions per

minute of the pinion for the 5:1 ratio. Fins are cast integrally with the speed reducer housing for low operating temperatures.

17. Contour Projector

Hoods are not necessary when magnified images of parts are compared with master tolerance charts or drawings in a lighted room with new contour projector made by Eastman Kodak Co., Rochester, N. Y., since light intensity can be varied over a wide range by means of a rheostat. For measuring surface features or sections where profile is obstructed, two auxiliary surface illuminators provide a bright image in natural color in-



stead of a shadow image. Both a surface and a profile image can be projected at the same time.

All lenses and mirrors used have been ultra-hard coated with the Lumenizing process to reduce light loss and increase contrast. Cabinet is dust tight and a forced air cooling system exhausts heat away from the base, work area and operator. Lens turret mounts up to five projection lenses to 100X which are indexed by turning a knob. Helix table positions threaded parts so that a normal plane is projected and there is an attachment for vertical inspection of thin parts where it is more convenient to direct light through a transparent work support such as a glass table.

18. Truck Load Pusher

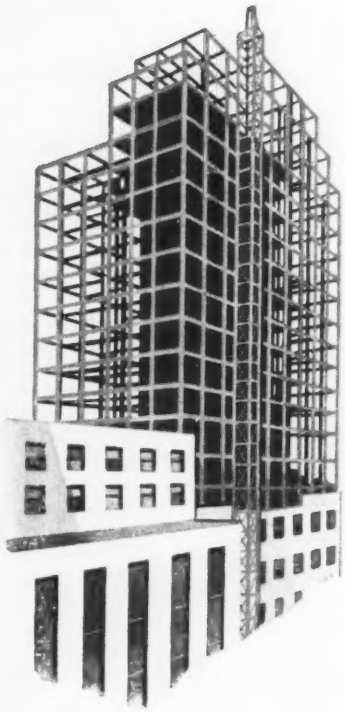
More efficient hydraulic operation and rugged construction are features of the improved pusher device for use on fork trucks made by Tructractor Division of Clark Equipment Co., Battle Creek, Mich. Material in cartons and bags may be easily removed from pallets by the device, eliminating piece by piece unloading.

Pusher rack travels horizontally to move material off the forks. The

A Great Name in Steel Fabrication

Wherever ships go or steel is erected, the Ingalls name is known. Ingalls all-welded ships set war records, are now in demand for peace. Ingalls barges and storage tanks are as numerous as their uses. Structural steel from Ingalls' four plants strengthens many of the newest and most specialized buildings.

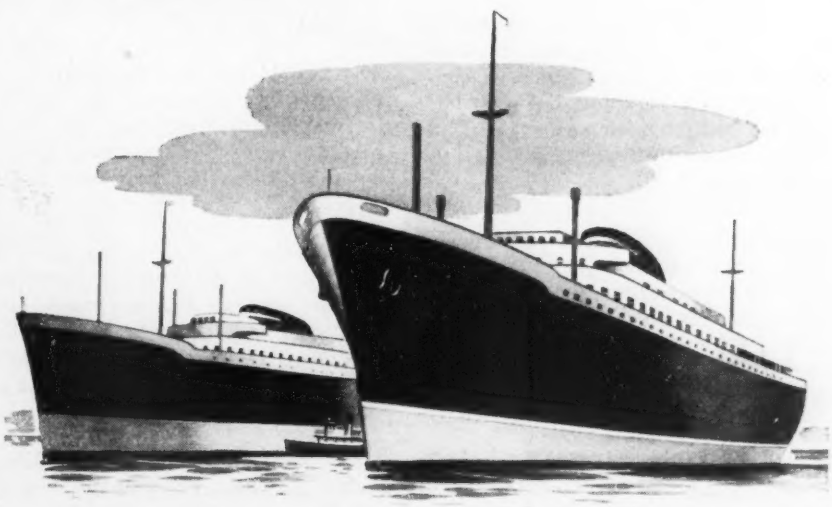
If you require fabricated steelwork in any form, specify Ingalls . . . one of America's master steel fabricators.



INGALLS

INDUSTRIES

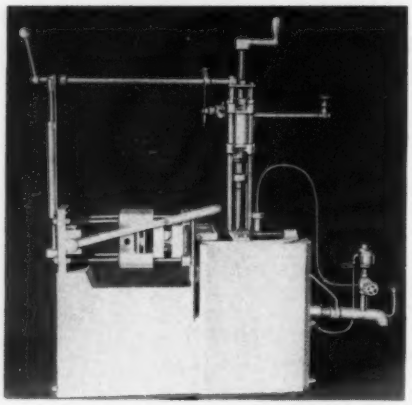
THE INGALLS IRON WORKS CO., THE INGALLS SHIPBUILDING CORP., The Steel Construction Co., Birmingham Tank Co. Fabricating plants at Birmingham, North Birmingham, Verona, Pa., Pascagoula, Miss., and Decatur, Ala. Offices at BIRMINGHAM, Pittsburgh, New York and New Orleans.



equalized pressure hydraulic cylinders are supported by two horizontal slide channels mounted on roller bearings. Maximum forward travel of pusher rack is 55-1/2 inches. This may be reduced by 1-inch increments for special needs.

19. Die Casting Machine

H. L. Harvill Mfg. Co., Corona, Calif., is announcing the model AHH-1 small production model, hot chamber type die casting machine which will cast zinc, lead and tin base alloys through a center gate. Dies are opened and closed by hand, with ejection of castings after solidification accomplished by the same manual method. Safety interlock makes it impossible to inject molten metal until dies are locked in closed position.



Machine is capable of as many as 500 cycles per hour, actual speed being dependent upon operator and nature of parts being cast. Vertical by horizontal normal die dimensions are 6 x 10 inches. Standard zinc alloy injection capacity is 14 ounces. It is equipped with gas burner unit and oil burner is available. Overall dimensions are: Width, 1 foot, 3 inches; length 4 feet, 4 inches; height, 5 feet.

DEVELOPED BY . . .

20. Ampco Metal Inc., Milwaukee 4, Wis., a self sharpening bronze floor scraper with serrated edges so constructed that scraping edge is flat against scraping surface. Tool is 8 inches wide. Primary use is on paint spray booth floors, walls.

21. Carbide & Carbon Chemicals Corp., New York 17, N. Y., Ucon synthetic lubricants for use in machines operating at high temperatures. Oxidation and decomposition products are large volatile, leaving little residue to clog bearings.

22. Standard Electrical Tool Co., Cincinnati 4, O., a redesigned ¼-horsepower type 30A tool post grinder with motor housing of aluminum. Equipment includes a 6 x ⅜ x ½-inch grinding wheel. Wheel revolves at 3600 revolutions per minute.

23. Fairchild Camera & Instrument Corp., Jamaica 1, N. Y., unit 263 laboratory gas temperature indicator for temperatures up to 5000° F. Insertion of probe into gas stream and operation of single control are only operations. Accuracy is 1 per cent up to 2000° F.

24. American - LaFrance - Foamite Corp., Elmira, N. Y., complete fire extinguishing system for protecting installations requiring localized or total flooding and for rotating electrical units requiring a sustained discharge of carbon dioxide.

25. Tri-Arc Corp., Chicago 37, Ill., high frequency unit for attachment to electric welders which provides a more constant flow of current because of extra impulses. It simplifies overhead welding and reduces difficulties of welding light gage metals.

26. Stackbin Corp., Pawtucket, R. I., adaptors to accommodate Stackrack combinations, so that smaller sizes can be combined with larger ones. They lock the Stackracks together without use of tools.

27. General Electric Co., Schenectady 5, N. Y., photoelectric recording wattmeter for analyzing welding circuits and measuring industrial heating or motor starting load and power surge. It will measure up to 10,000 cycles per second.

28. Westinghouse Electric Corp., Pittsburgh 30, Pa., type AYB heavy duty, rear connected, direct current magnet operated relay, available in 4, 6, 8, 10, 12 and 14 pole combinations. Design is for operation on 600 volts or below.

29. Leslie Co., Lyndhurst, N. J., a reversing superstructure for use on its diaphragm regulating valves. It permits reversing the valve action by substitution for standard superstructure.

30. Square D Co., Milwaukee 12, Wis., an oil tight pilot light for machine tool applications where cutting oils and coolants may affect operation. Designed for panel mounting, it is offered with color caps of various colors.

31. Pannier Bros. Stamp Co., Pittsburgh 12, Pa., an automatic high speed marking device for marking up to four sides of seamless and light wall aluminum, copper and brass tubing. Sizes may be from ⅜ to 2 inches in diameter. All are run at up to 300 feet per minute.

32. Cutler-Hammer Inc., Milwaukee 1, Wis., new brake shoe with clamp-on type lining for their line of type M magnetic brakes for mill and heavy duty service. Longer life lining is held in place by vice type clamp on brake shoe.

33. Metallizing Engineering Co. Inc., Long Island City 1, N. Y., Ruf-Tred tool for preventing slipping and falling accidents on smooth iron and steel surfaces. Its vibrating electrode holder deposits rough hard bead lines ⅛-inch wide and 1/16-inch high on the surface at rate of 5 feet per minute.

34. Borm Mfg. Co., Elgin, Ill., model G improved pneumatic hammer, 8 inches long, for cleaning welds, weld peening, chipping, metal cutting, etc. It is all steel, hardened where needed, operates with minimum vibration and delivers 5000 strokes per minute.

35. Bryant Heater Co., Cleveland 10, O., immersion heating burner assemblies which involve spacer cages which insure entrainment of required amounts of secondary combustion air in gas firing tubes for heating waters, oils and other liquids.

36. R. O. Hull & Co. Inc., Cleveland 13, O., No-Cro-Mist soluble liquid for adding to chromium plating baths to control evolution of mist by chemical means. Operation of bath is not affected by the solution.

37. Wendt-Sonis Co., Hannibal, Mo., new line of Spe-D-Cut reamers of standardized straight shank style. Thirteen diameters are offered, all with tolerances of 0.0005-inch on the diameter and diamond lapped cutting edges.

38. Lowebco Inc., Chicago 15, Ill., Oncrete synthetic paint for concrete for protection against acids and fumes in foundries and metal plants. It resists abrasion and will not check, chip or peel.

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

COAL STRIKE—Industrial paralysis is creeping over the nation. Accumulative effects of four weeks' suspension of coal mining is beginning to bear heavily on steel supply. The wheels of manufacturing industry now are slowing down alarmingly, and unless coal shipments are resumed quickly industrial production will be reduced to a trickle in a matter of a couple weeks as coal stocks are nearing exhaustion.

To date the miners' strike has cost the nation some 44 million tons of coal and over 500,000 tons of urgently needed steel. The miners have lost at least $115 million in wages, and the wage loss in other industries forced to curtail operations is equally staggering. Unemployment is rising at an alarming rate. Not only are some 400,000 miners idle, but working time of thousands of steelworkers has been shortened, and at least 60,000 railroad workmen furloughed. In addition hundreds of workmen in foundries and metalworking plants have been forced on short time, and layoffs in these industries are expected to mount rapidly.

STEEL OPERATIONS—Production of steel has fallen to the lowest level since the coal miners' holiday of last July. Last week the national steelmaking rate dropped another 10½ points to 78 per cent of capacity, equivalent to weekly output of about 1,400,000 tons and down 18 points since the start of the coal strike four weeks ago. Prior to the strike output of steel was about 1,700,000 tons weekly.

Sharp curtailments in openhearth operations were being made late last week and indications pointed to a severe slump in output this week. Bessemer steel production already had been cut severely. Blast furnace and coke oven operations have been reduced drastically. The drop in pig iron and coke output over the past month now is beginning to be reflected in steel making operations. Foundry activities have been seriously hit by the increasing shortage of pig iron and coke.

STEEL SUPPLY—Shipments to consumers are being cut back and in a few instances have been choked off entirely. Further projected cut in railroad transportation will add to shipment difficulties and the outlook is for a worsening in conditions before a turn for the better sets in.

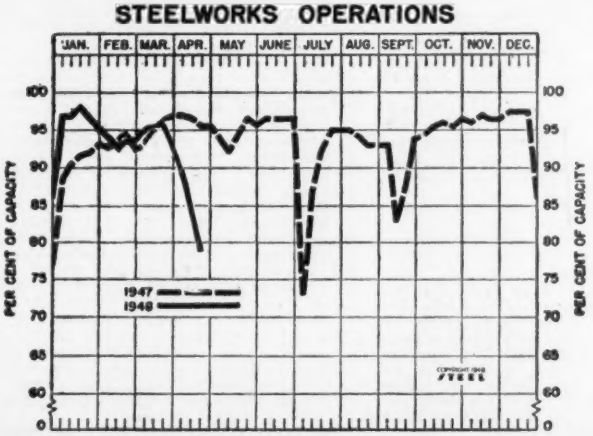
Severe cutbacks are reported in sheets and strip, products in most stringent demand since end of the war. Sharp curtailment in bessemer steel output is having a particularly noticeable effect on cold-drawn bar supply, deliveries being set back at least three weeks so far. Curtailments in open-hearth carbon bar production is causing some producers to blank out an entire month's quota.

An equally alarming situation is confronted in other products with steel finishing mills curtailing operations because of shrinking semifinished steel supplies. It is too early to estimate the extent to which consumer quotas will be reduced in the current quarter, but there is little question it will be substantial. Falling off in warehouse steel receipts promises to cut down available supplies to hundreds of thousands of small manufacturers.

PRICES—No signs are reported of any contemplated steel price changes in the immediate future. However, the future trend of prices depends on developments with respect to wages. Negotiations between the steel companies and the steelworkers union for an upward adjustment in wages got under way last week.

STEEL's arithmetical price composite on steelmaking scrap rose last week to $40.42 compared with $40.25 the preceding week and $34.92 a year ago. Steelmaking pig iron average, however, was down, being placed at $39.18 against $39.31 the week preceding and comparing with $32.49 a year ago. Composite average on finished steel held at $81.14 last week, compared with $69.82 a year ago, while the semifinished steel average was unchanged at $68.72 and compared with $52.10 last year.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended Apr. 10	Change	Same Week 1947	Same Week 1946
Pittsburgh	80	—14	97.5	69
Chicago	93	— 1	95.5	74.5
Eastern Pa.	65	—11	90.5	84
Youngstown	60	—23	86	70
Wheeling	87	— 6.5	93.5	86
Cleveland	95.5	+ 4	96	94.5
Buffalo	54	—31	88.5	90.5
Birmingham	45	—29	99	85
New England	80	+ 3	94	88
Cincinnati	96	None	92	79
St. Louis	89.5	+ 7	87.5	54
Detroit	104	None	93	88
Estimated national rate	78	—10.5	96.5	75.5

Based on weekly steelmaking capacity of 1,802,476 net tons for 1948; 1,749,928 tons for 1947; 1,762,381 tons for 1946.

News Summary—P. 51 *Engineering News—P. 81*

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	Apr. 10	Apr. 3	Month Ago Mar. 1948	Year Ago Apr. 1947	5 Years Ago Apr. 1943
Finished Steel	$81.14	$81.14	$81.14	$69.82	$56.73
Semifinished Steel	68.72	68.72	68.72	52.10	36.00
Steelmaking Pig Iron	39.18	39.31	39.34	32.49	23.00
Steelmaking Scrap	40.42	40.25	40.21	33.94	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

Mar. 1948	3.57435c
Feb. 1948	3.54027c
Mar. 1947	3.10998c
Mar. 1943	2.43678c

* **STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide base prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (re-rolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading basing points), and on Steelworks Scrap (No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composite, dollars per net ton; pig iron and scrap, gross ton.

† **FINISHED STEEL WEIGHTED COMPOSITE:** Computed in cents per pound, base prices, weighted by actual monthly shipments of following products, representing 82 per cent of total steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute; Structural shapes; plates; standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. February and March figures are preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton; others dollars per gross ton.

Finished Materials

	April 10, 1948	Mar., 1948	Jan., 1948	Apr., 1947
Steel bars, Pittsburgh	2.90c	2.90c	2.90c	2.60c
Steel bars, del. Philadelphia	3.356	3.356	3.348	2.98
Steel bars, Chicago	2.90	2.90	2.90	2.60
Shapes, Pittsburgh	2.80	2.80	2.80	2.50
Shapes, del. Philadelphia	2.968	2.968	2.966	2.64
Shapes, Chicago	2.80	2.80	2.80	2.50
Plates, Pittsburgh	2.95	2.95	2.95	2.65
Plates, del. Philadelphia	3.19	3.19	3.186	2.85
Plates, Chicago	2.95	2.95	2.95	2.65
Sheets, hot-rolled, Pittsburgh	2.80	2.80	2.80	2.50
Sheets, cold-rolled, Pittsburgh	3.55	3.55	3.55	3.20
Sheets, No. 10 galv., Pittsburgh	3.95	3.95	3.93	3.55
Sheets, hot-rolled, Gary	2.80	2.80	2.80	2.50
Sheets, cold-rolled, Gary	3.55	3.55	3.55	3.20
Sheets, No. 10 galv., Gary	3.95	3.95	3.93	3.55
Strip, hot-rolled, Pittsburgh	3.05	3.05	2.80	2.50
Strip, cold-rolled, Pittsburgh	3.80	3.80	3.55	3.20
Bright basic, bess. wire, Pittsburgh	3.775	3.775	3.695	3.425
Wire nails, Pittsburgh	5.20	5.20	4.67	4.125
Tin plate, per base box, Pittsburgh	$6.70	$6.70	$6.70	$5.75

Semifinished

Sheet bars, Pittsburgh, Chicago	$60.00	$60.00	$53.57	$44.64
Slabs, Pittsburgh, Chicago	45.00	45.00	40.18	37.506
Rerolling billets, Pittsburgh	45.00	45.00	40.18	37.506
Wire rod 5/16 to 1/4-inch, Pitts.	3.175c	3.175c	3.10c	2.55c

Pig Iron

	April 10, 1948	Mar., 1948	Jan., 1948	Apr., 1947
Bessemer, del. Pittsburgh (N.&S. sides)	$40.996	$40.996	$40.379	$34.83
Basic, Valley	39.00	39.00	38.40	33.00
Basic, eastern del. Philadelphia	42.004	42.004	41.372	35.52
No. 2 fdry., del. Pgh. (N.&S. sides)	40.496	40.496	39.879	34.33
No. 2 fdry., del. Philadelphia	42.504	42.504	41.871	36.02
No. 2 foundry, Chicago	39.00	39.00	38.60	33.00
No. 2 foundry, Valley	39.50	39.50	36.50	33.50
Southern No. 2, Birmingham	37.88	37.88	34.88	29.28
Southern, No. 2, del. Cincinnati	42.23	41.857	37.74	34.15
Malleable, Valley	39.50	39.50	38.90	33.50
Malleable, Chicago	39.50	39.50	39.10	33.50
Charcoal, low phos., fob Lyles, Tenn.	55.00	55.00	50.00	40.50
Ferromanganese, fob cars, Pittsburgh	151.00	151.00	151.00	140.25

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$40.25	$40.25	$40.30	$35.81
Heavy melt. steel, No. 2, E. Pa.	39.00	39.00	41.30	33.25
Heavy melt. steel, No. 1, Chicago	39.00	38.875	39.05	32.75
Heavy melt. steel, No. 1, Valley	40.25	40.25	40.04	34.56
Heavy melt. steel, No. 1, Cleveland	39.75	39.75	39.75	34.06
Heavy melt. steel, No. 1, Buffalo	43.00	44.00	43.30	34.25
Rails for rerolling, Chicago	49.50	49.625	60.00	38.25
No. 1 cast, Chicago	69.00	66.00	63.50	42.50

Coke

Connellsville, beehive furnace	$12.50	$12.50	$12.50	$9.06
Connellsville, beehive foundry	14.875	14.875	14.60	10.375
Chicago, oven foundry, del.	19.25	19.25	19.19	16.10

FINISHED AND SEMIFINISHED IRON STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants. Delivered prices do not include the 3 per cent federal tax on freight.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, $90-$95 per gross ton. Forging quality $46 per net ton, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown.

Alloy Steel Ingots: Pittsburgh, $56 per gross ton.

Rerolling Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Buffalo, Birmingham, $45 per net ton; Cleveland, $47 per net ton; sales by smaller interests on negotiated basis at $85 per gross ton, or higher.

Forging Quality Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, $54 per net ton.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $66 per gross ton.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Youngstown, $60 nom., per net ton; sales in open market $95-105 per gross ton.

Skelp: Pittsburgh, Youngstown, 2.90c per lb.

Tube Rounds: Pittsburgh, Chicago, Gary, Cleveland, $69-70 per net ton; some sellers quoting up to $120 per gross ton.

Wire Rods: Pittsburgh, Chicago, Birmingham, 5/16 to 1/4-inch, inclusive, $2.80-3.55 per 100 lb. 5/16 to 47/64-in., inclusive, $2.75, Cleveland; Galveston, $2.95; Worcester, $2.90-2.95. San Francisco (base del.), $3.5245.

Bars

Hot-Rolled Carbon Bars (O.H. only) and Bar-Size Shapes under 3-in.: Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham, base, 20 tons one size, 2.90c; Detroit, del., 3.06c; eastern Mich., 3.13c; New York, del., 3.392c; Phila., del., 3.356c; San Francisco (base, del.), 3.6345-3.95c; Los Angeles (base, del.), 3.629-3.86c; Seattle, 3.8375-3.85c, base.

Rail Steel Bars: Same basing points as merchant carbon bars, except base is 10 tons. Prices upon application.

Hot-Rolled Alloy Bars: Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 3.30c. (Texas Steel Co. uses Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lb., 3.55c; Detroit, del., 3.71c; Toledo, 3.78c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Canton, base 4.10c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.75c; San Francisco (base, del.), 3.3345c; Los Angeles (base, del.), 3.329c; Seattle, 3.88c-4.18c base.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo. Prices upon application.

Iron Bars: Single refined, Pittsburgh 8.65c-†7.70c, double refined †9.75c-10.00c; Pittsburgh, staybolt, 10.20c-†11.25c.

† Hand puddled.

Sheets

Hot-Rolled Sheets (18 gage and heavier): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Point, Ashland, Ky., base, 2.80c; Detroit, del., 2.96c; eastern Mich., del., 3.03c; Philadelphia, del., 3.04c; New York, del., 3.172c; Los Angeles (base, del.), 3.544c; San Francisco, (base, del.), 3.5495c, (Alan Wood Steel Co., Conshohocken, Pa., quotes 4.20c, Sparrows Point equivalent).

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.55c; Granite City, 3.65c; Detroit, del., 3.71c; Eastern Mich., del., 3.78c; New York, del., 4.042c; Philadelphia, del., 4.006c.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Canton, Middletown, 3.95c; Kokomo, 4.55c; Youngstown, 3.95-4.45c; Granite City, 4.35c; New York, del., 4.322c; Philadelphia, del., 4.19c; Los Angeles (base, del.), 4.724c; San Francisco (base, del.), 4.7295c.

Corrugated Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham base, 4.05c.

Culvert Sheets, No. 16 flat: (Based on 5 cent zinc; corrugated 10 cents extra) Pittsburgh, Chicago, Gary, Birmingham: Copper alloy, 4.55c; copper-iron or pure iron, 4.90c; Granite City 5.00c and 5.35c, respectively; copper alloy, 4.90c, Kokomo. Los Angeles (base, del.), 5.344c; San Francisco (base, del.), 5.3495c.

Aluminized Sheets: Hot-dipped, coils or cut to lengths: Pittsburgh, 7.50c.

Stainless-Clad 20%, annealed and pickled: Pittsburgh, Washington, No. 304, 22.00c; No. 410, 20.00c; No. 430, 20.50c; No. 446, 27.00c.

Long Ternes, No. 10: Pittsburgh, Chicago, Gary, base, 4.05c.

Enameling Sheets, No. 12: Pittsburgh, Chicago, Gary, Cleveland, Middletown, 3.95c; Youngstown 3.95c-4.45c; Granite City, 4.05c; Detroit, del., 4.11c; eastern Mich., 4.18c.

Electrical Sheets, No. 24: Field: Pittsburgh, Chicago, Gary, 4.50c; Kokomo, Ind., 4.60c. Armature: Pittsburgh, 4.80c-5.30c; Chicago, Gary, 4.80c; Granite City, Ill., 5.25c; Kokomo, Ind., 4.90c. Electrical: Pittsburgh, 5.30c-5.80c; Chicago, Gary, 5.30c; Granite City, Ill., 5.75c; Kokomo, Ind., 5.40c. Motor: Pittsburgh, 6.05-6.80c; Chicago, Gary, 6.05c; Granite City, 6.50c.

Dynamo: Pittsburgh, 6.75c-7.00c; Granite City, 7.20c. Transformer 72, 7.25-8.25c; 65, 7.95-9.20c; 58, 8.65-9.90c; 52, 9.45c, Pittsburgh.

Strip

Hot-Rolled Strip: Pittsburgh, 2.80c-3.30c; Chicago, Gary, Birmingham, Youngstown, base, 2.80c; Detroit, del., 2.96c; eastern Mich., del., 3.03c; San Francisco (base, del.), 3.605c; Los Angeles (base, del.), 3.60c.

Cold-Rolled Strip: 0.25 carbon and less: Pittsburgh, 3.55c-4.05c; Cleveland, Youngstown, 3.55c-3.85c; Chicago base, 3.65c; Detroit, del. 3.71c; eastern Mich., 3.78c; Worcester, base, 3.75c-4.45c.

Cold-Finished Spring Steel: Pittsburgh, Cleveland base: 0.26-0.40 carbon, 3.55c; over 0.40 to 0.60 carbon, 5.05c; over 0.60 to 0.80, 5.65c; over 0.80 to 1.05, 7.15c; over 1.05 to 1.35, 9.45c; add 0.20c for Worcester.

Tin, Terne, Plate

Tin Plate: Pittsburgh, Chicago, Gary, Warren, O., per base box of 100 lb, 1.25 lb coating $6.60, 1.50 lb coating $6.80; Granite City, Birmingham, Sparrows Point, 1.25 lb coating $6.70, 1.50 lb coating $6.90.

Electrolytic Tin Plate: Pittsburgh, Gary, Warren, O., per base box of 100 lb, 0.25 lb tin, $5.80; 0.50 lb tin, $6.00; 0.75 lb tin $6.20; Granite City, Birmingham, Sparrows Point, $5.90, $6.10, $6.30, respectively.

Can Making Black Plate: Pittsburgh, Gary, Warren, O., per base box of 100 lb, 55 to 70 lb basis weight, $5.20; 75 to 95 lb basis weight, $5.10; 100 to 128 lb basis weight, $5.20.

Hollowware Enameling Black Plate: Pittsburgh, Chicago, Gary, Warren, O., base 29-gage, 4.75c per lb; Granite City, Birmingham, Sparrows Point, 4.85c per lb.

Manufacturing Ternes (Special Coated): Pittsburgh, Chicago, Gary, per base box of 100 lb, $5.90; Granite City, Birmingham, Sparrows Point, $6.00.

Roofing Ternes: Pittsburgh, per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $15.50.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, 2.95c; Coatesville, 3.45c; Claymont, 3.65c; Geneva, Utah, (base, del.), 3.125c; Det., del., 3.21c; New York, del., 3.322c; Phila., del., 3.19c; Boston, del., 3.423c; St. Louis, del., 3.269c; San Francisco and Los Angeles, del., 3.693c for sizes and grades produced at Geneva, 3.76c for sizes and grades produced at Fontana, Calif.
(Central Iron & Steel Co., Harrisburg, Pa., 4.75c, basing points.)

Floor Plates: Pittsburgh, Chicago, Cleveland, 4.20c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, 3.80c-4.137c; Coatesville, 4.80c.

Clad Steel Plates: Coatesville, 10% cladding: Nickel clad, 21.50c; inconel-clad, 30.00c; monel-clad, 24.00c. Pittsburgh, Washington, Coatesville, Pa., 20% stainless-clad, base prices including annealing and pickling; No. 304, 24.00c; No. 410, 22.00c; No. 430, 22.50c; No. 446, 29.00c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.80c; New York, del., 3.088c; Phila., del., 2.968c; Geneva, Utah (base, del.), 2.975c; Los Angeles (base, del.), 3.41-3.474c for sizes produced at Torrance, Calif., beyond sizes at Geneva; Los Angeles and San Francisco, del., 3.543c for sizes produced at Geneva; San Francisco, del., 3.41c for sizes produced at Fontana, Calif.

Alloy Structural Shapes: Pittsburgh, Chicago, 3.55c.

Steel Piling: Pittsburgh, Chicago, Buffalo, $3.30 per 100 lb.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham per 100 pounds.)

Wire to Manufacturers in carloads

Bright, basic or bessemer	*$3.55–4.00
Basic MB Spring (except Birm.)	**$4.95
Upholstery Spring (except Birm.)	†$4.60

Wire Products to Trade in carloads

Wire, Merchant Quality	
Annealed (6 to 8 base)	††$4.20
Galvanized (6 to 8 base)	††$4.65

(Fob Pittsburgh, Chicago, Duluth, Birmingham, per base column).

Nails	
Standard, cement-coated, galvanized	‡94
Staples, polished and galvanized	‡‡94
Woven fence, 15½ gage and heavier	$100
Barbed wire, 80-rod spool	§§113
Fence Posts (with clamps)	107
Bale ties, single loop	$99

* Worcester, $3.65; Duluth, $3.60, base; San Francisco (base, del.), $4.56, bright basic only.
** Worcester, $5.05; Duluth & Trenton, N.J., $5.20 (bright only); San Francisco (base del.) $5.9845.
† Worcester $4.70; Duluth and Trenton, N. J., $4.85, base. San Francisco (base, del.) $5.6345 black upholstery.
†† One producer quotes 25 cents higher at Birmingham and Chicago; Worcester $4.30, annealed, $4.65, galvanized; Duluth $4.20, annealed, $4.65, galvanized; Kokomo, Ind., $4.80 annealed, $5.25 galvanized; San Francisco (base, del.) $5.21, annealed, $5.66 galvanized.
‡ Cols. 108 and 114 also quoted Pittsburgh; Worcester 100; Cleveland 97; San Francisco (base, del.) 115.
‡‡ Cols. 108 and 114 also quoted Pittsburgh; Worcester 100, San Francisco (base del.) 115.
§ San Francisco (base del.) 123.
§§ San Francisco (base del.) 133.

Rails, Supplies

Rails: Standard, over 60-lb fob mill, $2.75 per 100 lb. Light rails (billet), Pittsburgh, Birmingham, $3.10 per 100 lb; light rails (rail steel), Williamsport, Pa., Pittsburgh prices upon application.
Relaying, 60 lb and over fob warehouse $60-$65 per net ton.

Supplies: Track bolts, 7.00c; heat treated, 7.25c. Tie plates, $3.65 per 100 lb, fob mill; $3.40 base, Seattle; $3.80 base, Pittsburg, Calif. Splice bars $3.85 per 100 lb, fob mill. Standard spikes, 4.85c; screw spikes, 6.75c. Axles, 4.50c.

Tubular Goods

Standard Steel Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh on all types; Lorain on steel butt weld, and seamless; Gary, Ind., 2 points less on steel lap weld and 1 point less on steel butt weld on sizes produced in that district.

	Butt Weld				
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	44½	17	1	52½	36½
¼	44½	21½	1¼	53	37
⅜	41	17	1½	53½	37½
½	47	29½	2	54	38
¾	50	33½	2½ & 3	54½	38½

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	44½	28	44	27½	43½	27
2½ & 3	48½	32	47	30½	46½	30
3½-6	50½	34	49	32½	48½	32

Line Steel Pipe: Base price in carlots to consumers about $200 a net ton. Base discounts Pittsburgh and Lorain, O.

In.	Butt Weld	In.	Butt Weld
⅛	43½	1	51½
¼	43½	1¼	52
⅜	40	1½	52½
½	46	2	53
¾	49	2½ & 3	53½

In.	Lap Weld	Elec. Weld	Seamless
2	43½	43	42½
2½ & 3	46½	46	45½
3½-6	48½	48	47½
8	50½	50	49½
10	50	49½	49
12	49	48½	48

Standard Wrought Iron Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh.

	Butt Weld		Lap Weld	
In.	Blk.	Gal.	Blk.	Gal.
⅛	+11	+35	2	−1½	+20
¾	+ 1½	+25	2½-3½	−4	+16
1 and 1¼	− 4	+16½	4	−8	+10½
1½	− 9½	+13	4½-8	−6	+12
2	−10	+12½			

Boiler Tubes: Net base prices per 100 ft. fob Pittsburgh, in carload lots, minimum wall thickness, cut lengths 4 to 24 feet, inclusive.

		Seamless		Elec. Weld	
O.D. Sizes	B.W.G.	Hot Rolled	Cold Drawn	Hot Rolled	Cold Drawn
1"	13	....	$12.46	$11.51	$11.51
1¼"	13	....	14.76	11.48	13.64
1½"	13	$14.00	16.47	12.69	15.22
1⅞"	13	15.92	18.74	14.43	17.31
2"	13	17.84	20.99	16.17	19.39
2¼"	13	19.88	23.40	18.02	21.62
2½"	12	21.90	25.77	19.86	23.80
2½"	12	23.99	28.21	21.75	26.06
2¾"	12	25.42	29.90	23.05	27.63
3"	12	26.68	31.40	24.18	29.00
3¼"	11	31.06	36.55	28.16	33.77
3½"	11	33.35	39.26	30.23	36.27
4"	10	41.40	48.70	37.53	44.99
4½"	9	54.87	64.58	....	....
5"	9	63.52	74.74	....	....
6"	7	97.51	114.73	....	....

Pipe Cast Iron: Class B, 6-in. and over $79.50 per net ton, Birmingham; $84.50, Burlington, N. J.; $91.12, del. Chicago; 4-in. pipe, $5 higher; class A pipe, $5 a ton over Class B.

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago; add 19c per cwt in carlots, Lebanon, Pa. Additional discounts: 5 for carloads; 15 for full containers, except tire, step, plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	45 off
⅝ and ¾ x 6-in. and shorter	46 off
¾-in. and larger x 6-in. and shorter	43 off
All diameters longer than 6-in.	41 off
Tire bolts	35 off
Step bolts	43 off
Plow bolts	54 off
Lag bolts	
All diameters 6 in. and shorter	46 off
All diameters longer than 6 in.	44 off

Stove Bolts

In packages, nuts separate, 65-10 off; bulk 75 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
⅞-in. and smaller	46 off	....
½-in. and smaller	....	44 off
½-in.-1-in.	44 off	....
⅝-in.-1-in.	....	43 off
1⅛-in.-1½-in.	42 off	41 off
1⅝-in. and larger	....	35 off

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	53 off
Upset (1035 heat treated)	
⅝ and smaller x 6 and shorter	48 off
¾, ⅞, & 1 x 6 and shorter	44 off

Square Head Set Screws

Upset 1-in. and smaller	57 off
Headless, ¼-in. and larger	40 off
No. 10 and smaller	52 off

Rivets

Fob Pittsburgh, Cleveland, Chicago, Birmingham

Structural ½-in. and larger	5.65c
Lebanon, Pa.	5.65c plus 19c per cwt in cl., 26c lcl.
⅞-in. and under	55 off
Lebanon, Pa.	.55 off plus 19c per cwt in cl., 26c lcl.

Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, lcl ..... $1-$2 off

Tool Steels

Tool Steels: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 16.00-17.00c; extra carbon 20.00c; special carbon 24.00c; oil-hardening 26.00c; high carbon-chromium 47.00c.

W	Cr	V	Mo	Base Per lb
18.00	4	1	...	82.00c
1.5	4	1	8.5	59.00c
12	3	0.50	...	67.00c
6.40	4.15	1.90	5	63.00c
5.50	4.50	4	4.50	80.00c

Stainless Steels

Base, Cents per lb

Grade	Bars, Drawn Wire, Structurals	Plate	Sheets	Hot Rolled Strip	Cold Rolled Strip
CHROMIUM NICKEL STEELS					
301	26.00c	29.50c	37.00c	22.00c	28.00c
302	26.00	29.50	37.00	23.50	30.50
303	28.50	31.50	39.00	29.50	36.00
304	27.50	31.50	39.00	25.50	32.50
308	31.50	37.00	44.50	31.00	38.00
309	39.00	43.50	51.00	40.50	51.00
310	53.50	56.50	57.00	53.00	61.00
316	43.50	48.00	52.00	43.50	52.00
321	31.50	37.00	44.50	32.00	41.50
347	36.00	41.50	49.00	36.00	45.50
431	21.00	24.00	31.50	19.00	24.50
440A	26.00	31.00	36.50	26.00	30.50
STRAIGHT CHROMIUM STEEL					
408	23.50	27.00	32.00	23.00	29.50
410	20.50	23.50	29.00	18.50	24.00
416	21.00	24.00	29.50	20.00	25.50
420	26.00	31.00	36.50	26.00	39.50
430	21.00	24.00	31.50	19.00	24.50
430F	21.50	24.50	32.00	20.50	27.00
442, 443	24.50	28.00	35.50	26.00	35.00
446	30.00	33.00	39.50	38.00	56.50
†501	9.00	13.00	17.50	13.00	18.50
†502	10.00	14.50	18.50	14.50	19.50
‡STAINLESS CLAD STEEL (20%)					
304	....	....	24.00	22.00	....	....
410	....	....	22.00	20.00	....	....
430	....	....	22.50	20.50	....	....
446	....	....	29.00	27.00	....	....

† Low chromium. ‡ Fob Pittsburgh and Washington, Pa.; plate prices include annealing and pickling.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., base	$40.00	$40.50	$41.00	$41.50
Newark, N. J., del.	42.208	42.708	43.208	43.708
Brooklyn, N. Y., del.	....	44.10	44.60	....
Philadelphia, del.	42.004	42.504	43.004	43.504
Birmingham, base	35.88†	36.38†	....	....
Cincinnati, del.	....	42.23	....	....
Buffalo, base	40.00†	40.00†	40.50†	41.00
Boston, del.	47.776	47.776	48.276	....
Rochester, del.	42.22	42.22	42.72	43.22
Syracuse, del.	43.025	43.025	43.525	44.025
Chicago, base	38.50	39.00	39.50	40.00
Milwaukee, del.	40.08	40.58	41.08	41.58
Muskegon, Mich., del.	....	43.60	44.10	....
Cleveland, fob furnace	38.50†	39.00†	39.50†	40.00
Akron, del.	40.50	41.00	41.50	42.00
Duluth, base	39.00	39.50	40.00	40.50
Erie, Pa., base	38.50	39.00	39.50	40.00
Everett, Mass., base	....	45.00	45.50	....
Granite City, Ill., base	39.50	40.00	40.50	....
St. Louis, del.	40.25	40.75	41.25	....
‡Neville Island, Pa., base	39.00	39.50	39.50	40.00
Pittsburgh, del., N.&S. Sides	39.996	40.496	40.496	40.996
Provo, Utah, base	39.00	39.50	....	....
Seattle, Tacoma, Wash., del.	....	46.63	....	....
Portland, Oreg., del.	....	46.63	....	....
Los Angeles, San Francisco	46.13	46.63	....	....
Sharpsville, Pa., base	39.00	39.50	39.50	40.00
Steelton, Pa., base	40.00	40.50	41.00	41.50
Struthers, O., base	39.50	....	....	....
Swedeland, Pa., base	45.00	45.50	46.00	46.50
Toledo, O., base	38.50	39.00	39.50	40.00
Cincinnati, del.	42.70	43.20	....	....
Youngstown, O., base	39.00	39.50	39.50	40.00
Mansfield, O.	42.57	43.07	43.07	43.57

† Republic Steel Corp. quotes $3 a ton higher at Birmingham, effective Jan. 1, 1948; Republic quotes $2.375 higher for No. 2 foundry and malleable and $1.875 higher for basic at Buffalo, and $1.25 higher at Cleveland, effective on shipments during week ended Apr. 11.

‡ To Neville Island base add: 79.2c for McKees Rocks, Pa., $1.212 Lawrenceville, Homestead, McKeesport, Monaco; $1.788 Oakmont; $1.596 Verona; $1.788 Brackenridge; 99.6c to Ambridge and Aliquippa.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent (base)....$49.50
6.51-7.00..$50.75 9.01- 9.50. 57.00
7.01-7.50.. 52.00 9.51-10.00. 58.25
7.51-8.00.. 53.25 10.01-10.50. 59.50
8.01-8.50.. 54.50 10.51-11.00. 60.75
8.51-9.00.. 55.75 11.01-11.50. 62.00

Fob Jackson, O., per gross ton; Buffalo base $1.25 higher. Buyer may use whichever base is more favorable.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $77.50, Jackson, O.; $78.75, Niagara Falls; $78 open-hearth and $79 foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.05% Mn over 1%; $1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn.....$55.00 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge

Neville Island, Pa. $39.00

Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., $46.00. Philadelphia, $48.592, delivered. Intermediate phosphorus, Central furnace, Cleveland, $42.00.

Differentials

Basing point prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Metallurgical Coke

Price per Net Ton

Beehive Ovens

Connellsville, furnace	$12.00-$13.00
Connellsville, foundry	14.00- 15.75
New River, foundry	12.50
Wise county, foundry	11.15
Wise county, furnace	10.65

Oven Foundry Coke

Kearney, N. J., ovens	$18.75
Chicago, outside del.	18.00
Chicago, del.	19.25
Terre Haute, ovens	18.50
Milwaukee, ovens	18.75
New England, del.	20.40-20.45
Birmingham, del.	15.76
Indianapolis, ovens	18.50
Cincinnati, del.	18.95
Ironton, O., ovens	16.75
Erie, Pa., del.	19.45
Painesville, O., ovens	18.10
Cleveland, del.	19.60
Buffalo, del.	20.15
Detroit, del.	19.00
Philadelphia, ovens	17.75
Swedeland, Pa., ovens	17.75
Portsmouth, O., ovens	17.00

Coal Chemicals

Spot, cents per gallon

Pure and 90% benzol	21.00†
Toluol, two degrees	28.00
Industrial xylol	28.00
Solvent naphtha	28.00

Per pound fob works

Phenol (car lots, returnable drums)	12.50
Do., less than carlots	13.25
Do., tank cars	11.50

Eastern plants, per pound

Naphthalene flakes, balls, bbl. to jobbers, "household use"	11.00

Per ton, bulk, fob plants

Sulphate of ammonia	$40.00

† Freight allowed up to 2 cents.

Refractories

Net Prices

Per 1000, fob shipping point

Fire Clay Brick

Super Duty

Pa., Mo., Ky.	$92.00

High Heat Duty

Pa., Ill., Md., Mo., Ky.	73.00
Ala., Ga.	73.00
N. J.	78.00

Intermediate Heat Duty

Ohio	67.00
Pa., Ill., Md., Mo., Ky.	67.00
Ala., Ga.	59.00
N. J.	70.00

Low-Heat Duty

Pa., Md., Ohio	59.00

Ladle Brick

(Pa., O., Va., Mo.)

Dry Press	50.00
Wire Cut	48.00

Malleable Bung Brick

All bases	83.00

Silica Brick

Pennsylvania	73.00
Joliet, E. Chicago	82.00
Birmingham, Ala.	73.00

Basic Brick

Net tons, fob Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	64.00
Chem. bonded chrome	64.00
Magnesite brick	86.00
Chem. bonded magnesite	75.00

Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.

Bulk	27.00
Single bags	31.50

Dolomite

Domestic, dead-burned, bulk, net tons, fob Billmeyer, Blue Bell or Williams, Pa., Millville, W. Va., Nario, Millersville, Martin, Gibsonburg or Woodville, O., $11.05; Midwest (fob Thornton or McCook, Ill.), add $0.10; Missouri Valley (fob Dolly Siding, and Bonne Terre, Mo.), add $0.20.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (Natural) Lower Lake Ports

Old range bessemer	$6.60
Old range nonbessemer	6.45
Mesabi bessemer	6.35
Mesabi nonbessemer	6.20
High phosphorus	6.20

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.62% contract	15.25

Foreign Ore

Cents per unit, cif Atlantic ports

No. African low phos.	Nom.
Swedish basic, 60 to 68%	13.50-14.00
Spanish, No. African basic, 50 to 60%	Nom.
Brazil iron ore, 68-69% fob Rio de Janeiro, nom.	5.50-6.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$26-$28

Manganese Ore

48-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 67.60c-72.60c.

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	$37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$25.50-$26.00
45% no ratio	26.50
48% no ratio	28.50
50% no ratio	29.50
Brazilian—nominal	
44% to 2.5:1 lump	$33.65
Rhodesian	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb., Mo., cont., Mines	$0.75

Fluorspar

Metallurgical grade, fob shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $35; less than 60% $32.

HIGH-STRENGTH—LOW-ALLOY STEELS

Prices in dollars per 100 pounds

	Pittsburgh	Chicago	Gary	Youngstown	Sparrows Point	Buffalo	Bethlehem	Canton	Massillon
Sheet, Hot-Rolled	4.30	4.30	4.30	4.30	4.30	4.30	...	...	...
Cold-Rolled	5.30	5.30	5.30	5.30	...	5.30	...	...	...
Galvanized	6.00	...	...	...	...	6.00	...	...	...
Strip, Hot-Rolled	4.30	4.30	4.30	4.30	...	...	...	...	...
Cold-Rolled	5.30	5.30†	5.30†	5.30	...	...	...	...	...
Shapes, Structural	4.30	4.30	...	4.30	...	...	4.30	...	...
Plates	4.55	4.55	4.55	...	4.55	...	...	...	...
Bars, Small Shapes	4.45	4.45	4.45	4.45	...	4.45	...	4.45	4.45

† Nax High Tensile, produced by Great Lakes Steel Corp., quoted 10 cents higher.

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras

	SHEETS					STRIP		BARS				PLATES	
	H-R 10G	C-R 10G	C-R 17G	Gal. *10G	Gal. *24G	†H-R	†C-R	H-R Rds. ⅜" to 3"	C-F Rds. ½"& up	H-R Alloy (**4140)	Structural Shapes	Carbon ⅜"-¾"	Floor ⅜" & Thicker
Boston (city)	5.03	6.09[4]	5.79[4]	6.23[4]	7.58[4]	5.61	6.87	5.04	5.88	7.64	4.91	5.18	6.86
New York (city)	4.96	6.16	5.86	6.16	7.51	5.59	...	5.06	5.63	7.23	4.80	5.11	6.78
New York (country)	4.81	6.01	5.71	6.01	7.36	5.44	...	4.91	...	...	4.65	4.96	6.63
Philadelphia (city)	4.70	6.32	5.92	5.90	7.25	5.32	5.72	4.87	5.75	8.77	4.57	4.85	6.47
Philadelphia (country)	4.55	6.18	5.78	5.75	7.10	5.17	5.57	4.73	...	...	4.47	4.71	6.32
Baltimore (city)	4.32†	5.95	5.65	5.72	7.07	4.80	...	4.85	5.71	...	4.71	4.77	6.30
Baltimore (country)	4.17†	5.80	5.50	5.50	6.85	4.65	...	4.70	...	...	4.56	4.62	6.15
Washington (city)	4.81	...	...	...	...	5.08	...	5.14	5.79[13]	...	4.98	5.03	6.60
Washington (country)	4.71	...	...	...	...	4.98	...	5.04	...	...	4.88	4.93	6.50
Norfolk, Va.	4.90	...	...	...	...	...	...	5.20	6.00	...	5.15	5.15	6.90
Memphis, Tenn. (city)	4.82[20]‡‖	5.87[20]†	...	6.37	...	5.02[20]	...	4.97[20]	5.87	...	4.97[20]	5.17[20]	6.87[20]
Memphis, Tenn. (country)	4.72[20]‡‖	5.77[20]†	...	6.27	...	4.92[20]	...	4.87[20]	5.77	...	4.87[20]	5.07[20]	6.77[20]
Buffalo (city)	4.45	...	5.20[8]	6.05	...	5.25	5.65	4.40	5.10	6.85	4.40	5.00	6.25
Buffalo (country)	4.30	...	5.05[8]	5.50	...	4.70	5.50	4.25	4.95	6.85	4.25	4.45	5.75
Pittsburgh (city)	4.25‡‖	...	5.10††	5.65	6.90	4.35	5.35	4.40	5.10	6.85	4.40	4.60	5.90
Pittsburgh (country)	4.10‡‖	...	4.95††	5.50	6.75	4.20	5.20	4.25	4.95	6.85	4.25	4.45	5.75
Cleveland (city)	4.45	5.50[8]	5.20[8]	5.82	7.17	4.55	5.35	4.40	5.10	7.26	4.70	4.60	6.05
Cleveland (country)	4.30	5.35[8]	5.05[8]	...	...	...	5.20	4.25	4.95	...	...	4.45	5.90
Cincinnati	4.56	...	5.22	5.77	...	4.77	...	4.78	5.63	...	4.82	4.98	6.47
Detroit	4.55	...	5.30	...	...	4.72	5.63	4.50	5.22	7.10	4.77	4.88	6.28
Indianapolis	4.55	5.32[4]	...	5.87	7.12	4.65	5.90	4.70‡‡	5.40	8.85	4.70	4.90	6.35
Chicago (city)	4.45	5.50[8]	5.20[8]	5.65	6.90	4.35	5.45	4.40	5.10	6.85[9]	4.40	4.60	6.05
Chicago (country)	4.30	5.35[8]	5.05[8]	5.50	6.75	4.20	5.30	4.25	4.95	6.85[9]	4.25	4.45	5.90
Milwaukee	4.658	5.708[8]	5.408[8]	5.858	7.108	4.558	5.658	4.608	5.308	7.208[9]	4.608	4.808	6.258
St. Louis	4.78	5.83[8]	5.53[8]	6.02	7.27	4.68	5.82	4.73	5.47[12]	...	4.73	4.93	6.38
Birmingham (city)	4.45[20]‡‖	...	...	5.65	...	4.45[20]	...	4.40[20]	5.93[22]	...	4.40	4.65	6.86
Birmingham (country)	4.30[20]‡‖	...	...	5.50	...	4.30[20]	...	4.25[20]	...	...	4.25	4.50	...
New Orleans	4.98[20]**	...	6.29[18]	...	...	5.18[20]	...	5.13[20]††	6.29[11]	...	5.03[20]††	5.33[20]	7.29[20]
Omaha, Nebr.	5.462	...	...	6.712	8.012	5.362	...	5.412	6.112	7.562	5.412	5.612	7.062
Houston, Tex.	5.75	...	...	7.36	8.10	6.00	...	5.35	7.00[12]	...	5.85	5.85	6.50
Los Angeles (city)	5.75	7.75[8]	7.45[8]	7.40	8.80	6.05	8.70	5.50	7.35[22]	9.35[16]	5.35	5.55	7.65
Los Angeles (country)	5.60	7.60[8]	7.30[8]	7.25	8.65	5.90	8.55	5.35	7.20[1]	9.20[16]	5.20	5.40	7.50
San Francisco	5.40[21]	6.65[8]	...	7.05[8]	7.95[8]	5.75[21]	8.70[18]	5.05[21]	7.00[12]	...	5.30[21]	5.50[21]	7.10[21]
Seattle, Tacoma, Wash.	5.30[17]‡‖	...	7.10[8]‡	6.95	...	5.60[17]	...	5.45[17]	7.45[19]	8.50[13]	5.25[17]	5.55[17]	7.65[17]
Portland, Oreg.	5.30[17]‡‖	...	7.10[8]‡	6.70	...	5.60[17]	...	5.45[17]	7.45[19]	...	5.25[17]	5.45[17]	7.55[17]

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over, cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [8]—400 to 1499 lb; [9]—1000 to 1999 lb; [11]—1000 to 39,999 lb; [12]—1000 lb and over; [13]—2000 lb and over; [17]—300 to 9999 lb; [19]—1500 to 1999 lb; [20]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [22]—500 to 1499 lb.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; ** as rolled; †† add 0.40 for sizes not rolled in Birmingham; ‡‡ add 15c for 100 lb for slow moving items; §§ 18 gage and heavier.

PRICES OF LEADING FERROALLOYS PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $52, Palmerton, Pa., $51, Pittsburgh, 16% to 19% Mn., $51, Palmerton, $50, Pittsburgh.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.). Carload, lump, bulk $145 per gross ton of alloy, carload packed $157, ton lot $172, less ton $189; fob New Orleans, Mobile, Philadelphia, Baltimore, or New York. Carload, lump, bulk $151, fob cars Pittsburgh, including 50c switching charge. Add, or subtract, $1.80 for each 1%, or fraction thereof, of contained manganese over 82% or under 78%. **West Coast Prices:** Carload (80,000 lb or more), lump, bulk, same price and basing points as above. All other prices for shipment from Pacific Coast warehouses, add $26.21 to above prices. Delivery is fob Portland, Los Angeles, South San Francisco, or Seattle warehouses, with railroad freight allowed on shipments of 25 gross tons or more.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Eastern Zone, carload, lump, bulk, max. 0.10% C, 22.5c per lb of contained Mn, carload packed 23.25c, ton lot 24.35c, less ton 25.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Eastern Zone, carload, lump, bulk 16.5c per lb of contained Mn, carload packed 17.25c, ton lot 18.35c, less ton 19.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Eastern Zone, carload, 2" x D, bulk 32c per lb of metal, carload packed 32.5c, ton lot 34c, less ton 36c; Central, add 1c for c.l. and 1.45c for l.c.l.; Western, add 1.45c for c.l. and 2.4c for l.c.l. Freight allowed. Spot, add 2c.

Silicomanganese: (Mn 65-70%). Eastern Zone, contract, lump, bulk, 1.50% C grade, 17-20% Si, 7.8c per lb of alloy, carload packed, 8.55c, ton lot 9.45c, less ton 10.45; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5 for l.c.l. Freight allowed. For 2.0% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Eastern Zone, contract, c.l., lump, bulk 18.6c per lb of contained Cr, c.l., packed 19.5c, ton lot 20.65c, less ton 22.05c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Eastern Zone, contract, c.l.,8MxD, bulk 20.1c per lb of contained Cr, c.l., packed 21.0c, ton lot 22.35c, less ton 24.1c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Eastern Zone, contract, carload, lump, bulk, max. 0.03% C 28.5c per lb of contained Cr, 0.04% C 27.5c, 0.05% C 27.0c, 0.06% C 26.5c, 0.10% C 26.0c, 0.15% C25.5c, 0.20% C 25.25c, 0.50% C 25.0c, 1% C 24.5c, 2% C 24.25c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, add C 1.25% max.). Eastern Zone, contract, carload, lump, bulk 25c per lb of contained chromium, carload, packed 26.1c, ton lot 27.3c, less ton 29.1c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 2c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 2c for each 0.25% of N above 0.75%.

Chromium Metal: (Mn. 97% Cr and 1% Fe). Eastern Zone, contract, carload, 1" x D, packed, max. 0.50% C grade, 93c per lb of contained chromium, ton lot 94.5c, less ton 97c; Central, add 1.5c for c.l. and 2.5c for l.c.l.; Western, add 2.75c for c.l. and 4.5c for l.c.l. Freight alowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 9.3c per lb of contained Si carload packed 10.9, ton lot 12.35c, less ton 14.0c; Central, add 0.5c for c.l. and 1.25c for l.c.l.; Western, add 0.7c for c.l. and 1.8c for l.c.l. Freight allowed. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (All 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 11.8c per lb of contained Si carload packed 13.1c, ton lot 14.25c, less ton 15.5c; Central, add 0.3c for c.l. add 0.75c for l.c.l.; Western, add 1.05c for c.l. and 5c for l.c.l. Freight allowed. Spot, add 0.3c.

85% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 13.3c per lb of contained, Si carload packed 14.55c, ton lot 15.55c, less ton 16.7c; Central, add 0.3c for c.l. and 0.7c for l.c.l.; Western, add 1.05c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk, 15c per lb of contained Si carload packed 16.2c, ton lot 17.15c, less ton 18.2c; Central, add 0.3c for c.l. and 0.65c for l.c.l.; Western, add 1c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Over 97% Si and 1% max. Fe). Eastern Zone, c.l., lump, bulk, regular 17.3c per lb of Si, c.l. packed 18.5c, ton lot 19.4c, less ton 20.4c; Central, add 0.6c for c.l. and 2.25c for l.c.l.; Western, add 1.2c for c.l. and 4c for l.c.l. Add 1c for max. 0.20% calcium grade. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing over 96% Si. Spot, add 0.25c.

Alsifer: (Aprox. 20% Al, 40% Si, 40% Fe) Contract basis fob Niagara Falls, N. Y., lump per lb c.l. 6.90c; ton lots packed, 7.40c; 200 to 1999 lb, 8.15c; smaller lots, 8.65c. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3% lb each and containing exactly 2 lb of Cr). Eastern Zone, contract, carload, bulk, 12.5c per lb or briquet, carload packed 13.2c ton lot 14.0c, less ton 14.9c; Central, add 0.25c for c.l. and 0.9c for l.c.l.; Western, add 0.35c for c.l. and 1.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Eastern Zone, contract, carload, bulk, 8.7c per lb of briquet, c.l. packaged 9.5c, ton lot 10.3c, less ton 11.2c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Eastern Zone, contract, c.l. bulk 8.75c per lb of briquet, c.l. packed 9.55c, ton lot 10.35c, less ton 11.25c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Eastern Zone, contract, carload, bulk 5.1c per lb of briquet, c.l. packed 5.25c, ton lot 6.7c, less ton 7.6c. **(Small size**—weighing approx. 2½ lb and containing exactly 1 lb of Si). Eastern Zone, carload, bulk 5.25c, c.l. packed 6.05c, ton lot 6.85c, less ton 7.75c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.45c for c.l. and 0.9c for l.c.l. Freight allowed. Add 0.25c for notching, small size only. Spot, add 0.25c.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Eastern Zone, contract, carload, lump, bulk 17.50c per lb of alloy, carload packed 19.0c, ton lot 19.8c, less ton 20.8c; Central, add 0.5c for c.l. and 0.85c for l.c.l.; Western, add 2.55c for c.l. and 2.6c for l.c.l. Freight allowed. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Eastern Zone, contract, carload, lump, bulk 16.25c per lb of alloy, carload packed 16.45c, ton lot 19.35c, less ton 20.85c; Central, add 0.5c for c.l. and 0.75c for l.c.l.; Western, add 2.55c for c.l. and 2.90c for l.c.l. Freight allowed. Spot, add 0.25c.

VANADIUM ALLOYS

Ferrovanadium: Open Hearth Grade (Va 50-55%, Si 8% max., C 3% max.). Eastern Zone, contract, any quantity, $2.90 per lb of contained Va; Central, add 2c for c.l. and 3c for l.c.l.; Western, add 6c for c.l. and 9c for l.c.l. Freight allowed. Spot, add 10c. **Special Grade** (Va 50-55%, Si 4% max., C 1% max.), $3. **High Speed Grade** (Va 50-55%, Si 1.50% max., C .20% max.), $3.10.

Vanadium Oxide: All Zones, contract, less carload lots, $1.20 per lb of contained V_2O_5. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

TITANIUM ALLOYS

Ferrotitanium: (Ti 20-25%, Al 3% max., Si 4% max., C 0.10% max.). Eastern Zone, contract, ton lot, 2" x D, $1.35 per lb of contained Ti, less ton $1.40. (Ti 40-45%, Al 7% max., Si 4% max., C 0.10% max.). Ton lot $1.23, less ton $1.25; Central, add 4c for 20-25% Ti grade, and 2.1c for 40-45% grade; Western, add 13.5c for 20-25% Ti grade, and 7.2c for 40-45% grade. Freight allowed. Spot, add 5c.

Ferrotitanium, High-Carbon: (15-20%). Contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Eastern Zone, contract, 10,000 lb W or more, $2.25 per lb of contained W; 200 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Eastern Zone, contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Eastern Zone, contract, c.l., lump, bulk 6c per lb of alloy, c.l. packed 6.75c, ton lot 7.5c, less ton 8.35c; Central, add 0.25c for c.l. and 1.1c for l.c.l.; Western, add 0.6c for c.l. and 3.95c for l.c.l. Freight allowed. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Eastern Zone, contract, carload, lump, packed 18.4c per lb of alloy, ton lot 19.15c, less ton 20.40c; Central, add 0.6c for c.l. and 1.05c for l.c.l.; Western add 3.05c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Eastern Zone, contract, 100 lb or more, 1" x D, $1.20 per lb of alloy, freight allowed. Less than 100 lb $1.30; Central, add 0.75c; Western add 2.9c, freight allowed. Spot, add 5c.

Borosil: (3 to 4% B, 40 to 45% Si). $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Eastern Zone, contract, ton lot, 2" x D, $2.50 per lb of contained Cb, less ton $2.55; Central, add 1.65c; Western, add 6.45c. Freight allowed. Spot, add 10c.

CMSZ Mixes: No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Eastern Zone, carload, 12 M x D, carload packed 17.25c per lb of material, ton lot 18.00c, less ton 19.25c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Eastern Zone, carload, packed, 1" x D, 39c per lb of alloy, ton lot 41c, less ton 43c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Eastern Zone, contract, carload, packed, ½" x 12 M, 15.0c per lb of alloy, ton lot 15.75c, less ton 17.0c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed. Spot, add 0.25c.

Simanal: (Approx. 20% each Si, Mn, Al). Packed, lump, carload 10c, ton lots 10.25c, smaller lots 10.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus: 17-19% based on 18% P content with unitage of $3 for each 1% of P above or below the base) Gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferromolybdenum: (55-75%). Per lb, contained Mo. fob Langeloth and Washington, Pa. furnace, any quantity 95.00c.

Acute Metal Shortage Pends

(*Concluded from Page* 57)

consumers also have purchased domestic secondary lead at premiums. The United States has been importing substantial tonnages of lead concentrates and there was danger that unless the domestic price was in line with the world market these concentrates would move elsewhere. With domestic demand running in excess of domestic mine production plus secondary recovery, it is essential that 1947's imports of over 200,000 tons of lead be maintained.

Tin—Consumption of tin is restricted by the rate of production at the Texas City smelter and the amounts allocated to this country by the Combined Tin Committee. Reconstruction Finance Corp. has purchased 11,384 tons of pig tin to apply against the 17,850 tons allocated to this country for the first half of 1948.

During 1948, world production should rise to at least 150,000 tons and may reach 160,000 tons compared with about 110,000 tons in 1947, according to the Office of Materials Distribution. Out of this production, the United States should receive at least 32,000 tons of concentrates and 35,000 tons of tin metal. These amounts, together with 24,000 tons from secondary sources, would provide supplies of 91,000 tons and without any transfer to the strategic stockpile would allow consumption of 3500 tons more than in 1947. A decision to transfer tin to such a stockpile would mean correspondingly less tin available, and consumption would have to be held to the 1947 levels or less.

Resumption of large-scale mining operations in the Far East has been retarded since the end of the war by difficulties in replacing members of the tin mining companies' technical staffs who were lost during the war period and in delays in getting dredges into production.

Magnesium—Government stockpiling of possibly several hundred million pounds of magnesium ingot a year against the possibility of a war, was urged in New York recently by T. H. McConica, assistant general manager, Magnesium Division, Dow Chemical Co., Midland, Mich., and chairman of the Magnesium Subcommittee of the Industry Advisory Committee to the Munitions Board.

He said that in the event of war it would require two and one-half years to restore magnesium ingot production to 500 million pounds a year, reached in World War II.

Copper—Members of the copper industry met with the Army and Navy Munitions Board late last week, but it is not known at this writing whether certain amounts of red metal must be set aside for the government stockpile. If this action is required, the present stringency will be aggravated.

Mill copper requirements are estimated at about 115,000 to 120,000 tons per month while domestic mine production plus the normal flow of scrap will average about 80,000 tons per month. It will be necessary, on this basis, to make up this deficit plus stockpiling requirements from foreign copper sources. Imports of refined copper in February amounted to 21,467 tons compared with 17,361 tons in January.

Zinc—Supplies of zinc have tightened rapidly since last July, due mainly to heavy withdrawals from OMR's stocks for the permanent stockpile. At the end of February, stocks of slab zinc totaled only 53,473 tons compared with 183,718 tons at the end of July, 1947.

NONFERROUS METAL PRICES

Copper: Electrolytic, carloads 21.50c, delivered Conn.; Lake, 21.62½c del. Conn. Dealers may add ¾c for 5000 lb to carload; 1c 1000-4999 lb; 1½c, 500-999 lb; 2c 0-499 lb. Casting, nom., refinery, 20,000 lb or more; nom., less than 20,000 lb.

Brass Ingot: 85-5-5-5 (No. 115) 19.00-19.25c; 88-10-2 (No. 215) 28.00c; 80-10-10 (No. 305) 24.25c; No. 1 yellow (No. 405) 15.00-16.00c; carlot prices, including 25c per 100 lb freight allowance; add ¼c for less than carloads.

Zinc: Prime western 12.00c, brass special 12.25c, intermediate 12.50c, E. St. Louis; high grade 13.00c, del., carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.4c; under 2000 lb 0.50c.

Lead: Common 17.30c-17.35c, chemical 17.40c, corroding 17.40c, E. St. Louis for carlots.

Primary Aluminum: 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add ½c 2000-9999 lb; 1c less through 2000 lb.

Secondary Aluminum: Piston alloy (No. 122 type) 16.00-16.75c; No. 12 foundry alloy (No. 2 grade) 15.75-16.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1 (95-97½%) 16.00-17.00c; grade 2 (92-95%) 15.75-16.50c; grade 3 (90-92%) 15.50-15.75c; grade 4 (85-90%) 15.00-15.50c. Above prices for 30,000 lb or more; add ¼c 10,000-30,000 lb; ½c 5000-10,000 lb; ¾c 1000-5000 lb; 1¼c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots (4-notch, about 20 lb), 10,000 lb and over, 20.50c, fob Freeport, Tex.; 2000 to 9999 lb, 21.50c; 100 to 1999 lb, 22.50c. Extruded rounds, 12 inches long, 1.312 inches in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb. 42.00-46.00c; 100 to 4000 lb, 35.00-36.00c.

Tin: Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lb, 1½c 1000-2239, 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (including Straits), 94.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05% max. arsenic, 93.85c; Grade C, 99.65-99.79% incl. 93.50c; 99.00-99.64% 93.50c and 98.00-98.99%, 92.60c for tin content.

Antimony: American bulk carlots fob Laredo, Tex., 99.0% to 99.5% and 99.8% and over but not meeting specifications below, 33.00c; 99.8% and over (arsenic, 0.05% max.; other impurities, 0.1% max.) 33.50c. On producers' sales add ¼c for less than carload to 10,000 lb; ½c for 224-999 lb; add 2c for 223 lb and less; on sales by dealers, distributors, and jobbers add ½c, 1c, and 3c, respectively.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked 33.75c lb; 25 lb pigs produced from electrolytic cathodes 35.25c lb; shot produced from electrolytic cathodes 36.25c lb; "F" nickel shots or ingots for addition to cast iron 34.25c lb. Prices include import duty.

Mercury: Open market, spot, New York, $76-$78 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $20.50 per lb contained Be.

Cadmium: Bars, ingots, pencils, pigs, plates, rods, slabs, sticks, and all other "regular" straight or flat forms $1.75 lb, del.; anodes, balls, discs and all other special or patented shapes, $1.80.

Cobalt: 97-98%, $1.65 lb for 550 lb (keg) $1.67 lb for 100 lb (case); $1.72 lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, N. Y., 74.62½c. per ounce.

Platinum: $86-$89 per ounce.

Palladium: $24 per troy ounce.

Iridium: $105-$115 per troy ounce.

Rolled, Drawn, Extruded Products

Copper and brass product prices are fob mill, with freight prepaid on 200 lb or more.

Sheet: Copper 33.68c; yellow brass 30.16c; commercial bronze, 95% 33.80c, 90% 33.27c; red brass, 85% 32.23c, 80% 31.70c; best quality 31.09c; Everdur, Duronze, Herculoy or equiv., hot-rolled, 38.56c; nickel silver, 18%, 42.42c; phosphor bronze, grade A, 5%, 52.70c.

Rods: Copper, hot rolled 30.03c, cold drawn 31.03c; yellow brass, free cutting, 24.69c; commercial bronze, 95% 33.49c, 90% 32.96c; red brass, 85% 31.92c, 80% 31.39c; best quality 30.78c.

Seamless Tubing: Copper 33.72c; yellow brass 32.92c; commercial bronze 90% 35.68c; red brass 85% 34.89c, 80% 34.36c; best quality brass 33.50c.

Wire: Yellow brass 30.45c; commercial bronze, 95% 34.09c, 90% 33.56c; red brass, 85% 32.52c, 80% 31.99c; best quality brass 31.38c.

Copper Wire: Bare, soft, fob eastern mills, carlots 26.80c, less carlots 27.30c; weatherproof, fob eastern mills, carlots 27.35c, less carlots 27.85c; magnet, delivered, carlots 29.75c-31.13c, 15,000 lb or more 30.00c-31.38c, less carlots 30.50c-31.88.

Aluminum Sheets and Circles: 2s and 3s mill finish; base price, cents per pound, 30,000 lb or more, bulk or skid packing, fob shipping point. Transportation allowance: Actual transportation charges not exceeding the rail freight rate applicable to shipments of 30,000 lb are deducted on shipments of 500 lb or more.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	24.0	...	...
0.135-0.126	12-48	24.5	...	...
0.125-0.096	12-48	24.5	23.1	26.3
0.095-0.077	12-48	25.0	23.2	26.5
0.076-0.061	12-48	25.5	23.4	26.7
0.060-0.048	12-48	25.7	23.6	27.0
0.047-0.038	12-48	26.1	23.8	27.3
0.037-0.030	12-48	26.4	24.1	27.7
0.029-0.024	12-48	26.8	24.4	28.1
0.023-0.019	12-36	27.4	24.8	28.6
0.018-0.017	12-36	27.9	25.3	29.3
0.016-0.015	12-36	28.6	25.9	30.1
0.014	12-24	29.4	26.6	31.1
0.013-0.012	12-24	30.2	27.3	32.0
0.011	12-24	31.1	28.1	33.1
0.010-0.0095	12-24	32.1	29.0	34.3
0.009-0.0085	12-20	33.2	30.0	35.7
0.008-0.0075	12-20	34.4	31.1	37.1
0.007	12-18	35.7	32.3	38.8
0.006	12-18	37.0	33.5	42.6

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Lead Products: Prices to jobbers, fob Cleveland, Pittsburgh: Sheets, full rolls, 140 sq ft or more, $20.85 per cwt.; add 50c per cwt., 10 sq ft to 140 sq ft; $1.25, less than 10 sq ft; $1, circles and segments.
Pipe: Full coils, $20.10 per cwt; cut coils, $20.35.
Lead Traps and Bends: List price plus 52%.

Zinc Products: Sheet, 16.50c-17.00c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 15.25c-16.00c, fob mill, 36,000 lb and over. Plates, not over 12-in., 14.25c; over 12-in., 15.25c.

Plating Materials

Chromic Acid: 99.75%, flake, fob Philadelphia, carloads, 22.00c; 5 tons and over 22.50c; 1 to 5 tons, 23.00c; less than 1 ton, 23.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 30.59c; oval, 30.09c; electrodeposited, 29.84c; cast, 29.59c.

Copper Carbonate: 52-54% metallic Cu; 50 lb bags, 25.00c fob Cleveland.

Copper Cyanide: 70-71% Cu, 100-lb drums, 45.00c fob Cleveland.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 400 lb, 16.00c, 500 lb and over, 15.00c, fob Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 48.00c; 10,000 to 30,000 lb, 49.00c, 3000 to 10,000 lb, 50.00c; 500 to 3000 lb. 51.00c; 100 to 500 lb, 53.00c; under 100 lb, 56.00c; add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 23.50c; 275-lb, or 500 bbls. 21.50c, fob Cleveland.

Tin Anodes: Bar, 1000 lb and over 110.00c, 500 to 1000 lb, 110.50c; 200 to 5000 lb, 111.00c; less than 200 lb, 112.50c; ball, 1000 lb and over, 112.25c; 500 to 1000 lb. 112.75c; 200 to 500 lb, 113.25c; less than 200 lb, 114.75c, fob Sewaren, N. J.

Tin Chloride: Fob Grasselli, N. J., 625 lb bbls., price on application.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers and resellers, 67.4c; 100 or 300 lb drums only, 100 to 500 lb, to consumers 59.2c, to resellers 54.8c; 600 to 1900 lb, to consumers 56.8c, to resellers 52.5c; 2000 to 9900 lb, to consumers 55.0c, to resellers 50.9c; 10,000 lb or more l.c.l., to consumers 53.9c, to resellers 49.9c; carloads, to consumers 52.7c, to resellers 48.7c. Prices fob Sewaren, N. J.

Zinc Cyanide: 100-lb drums 36.00c, fob Cleveland or Detroit; 35.00, fob Philadelphia.

Scrap Metals

BRASS MILL ALLOWANCES

(Based on 21.50c, Conn., for copper)

Prices for less than 15,000 lb fob shipping point. Add ⅝c for 15,000-40,000 lb; 1c for 40,000 or more.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	19.125	19.125	18.375
Yellow brass	15.625	15.375	14.750
Commercial Bronze			
95%	18.125	17.875	17.375
90%	17.625	17.375	16.875
Red brass			
85%	17.500	17.250	16.750
80%	17.250	17.000	16.500
Best Quality (71-79%)	16.625	16.375	15.875
Muntz Metal	14.750	14.500	14.000
Nickel silver, 5%	16.500	16.250	8.250
Phos. bronze, A. B.	20.750	20.500	19.500
Naval brass	15.250	15.000	14.500
Manganese bronze	15.250	15.000	14.375

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 18.00, No. 2 copper 17.00, light copper 16.00, composition red brass 14.75-15.00, auto radiators 11.75-12.00, heavy yellow brass 10.75-11.00, brass pipe 11.50.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 18.50-18.75, No. 2 copper 17.50-17.75, light copper, 16.50-16.75, refinery brass (60% copper), per dry copper content 16.25-16.50.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 16.25-16.75, No. 2 15.50-16.00, light copper 14.25-14.75, No. 1 composition red brass 12.50-13.00, No. 1 composition turnings 12.00-12.50, mixed brass turnings 7.50-7.75, new brass clippings 12.50-13.00, No. 1 brass rod turnings 10.00-10.50, light brass 6.50-7.00, heavy yellow brass 9.00-9.50, new brass rod ends 10.50-11.00, auto radiators, unsweated 9.75-10.25, cocks and faucets 9.75-10.25, brass pipe 9.75-10.25.

Lead: Heavy 15.25, battery plates 9.25, linotype and stereotype 16.00-16.50, electrotype 13.50-14.00, mixed babbitt 14.75, solder joints 17.75.

Zinc: Old zinc 5.50-5.75; new die cast scrap 4.75-5.25, old die cast scrap 2.75-3.25.

Tin: No. 1 pewter 60.00-62.00, block tin pipe 77.00-78.00, auto babbitt 47.00, No. 1 babbitt 48.00, siphon tops 45.00-47.00.

Aluminum: Clippings 2S 9.00-9.50, old sheets 7.00-7.50, crankcases 7.00-7.50, borings and turnings 2.50-3.00, pistons, free of struts, 6.00-6.50.

Nickel: Anodes 16.00-17.00, turnings 12.50-13.00, rod ends 16.00-17.00.

Monel: Clippings 12.00-12.50, turnings 7.00-7.25, old sheets 10.00-10.50, rods 10.00-10.50, castings 9.00.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
March Average:	21.500	14.825	12.000	94.000	15.000	33.000	33.750	74.625
Apr. 1-3	21.500	14.80-14.85	12.000	94.000	15.000	33.000	33.750	74.625
Apr. 5-8	21.500	17.30-17.35	12.000	94.000	15.000	33.000	33.750	74.625

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, fob Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	$40.00-40.50*
No. 2 Heavy Melt. Steel	40.00-40.50*
No. 1 Busheling	40.00-40.50*
Nos. 1, 2 & 3 Bundles	40.00-40.50*
Machine Shop Turnings	36.00-36.50
Mixed Borings, Turnings	36.00-36.50
Short Shovel Turnings	36.50-37.50
Cast Iron Borings	36.00-37.00
Bar Crops and Plate	47.50-48.00
Low Phos. Steel	47.50-48.00
Heavy Turnings	40.50-41.00

Cast Iron Grades

No. 1 Cupola	65.50-66.50
Charging Box Cast	48.00-49.00
Heavy Breakable Cast	48.00-49.00
Unstripped Motor Blocks	52.00-53.00
Malleable	69.00-70.00
Brake Shoe	52.00-53.00
Clean Auto Cast	58.00-59.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	41.00-41.50
R.R. Malleable	75.00-80.00
Axles	51.50-52.00
Rails, Rerolling	56.00-57.00
Rails, Random Lengths	60.00-61.00
Rails, 3 ft and under	61.50-62.00
Rails, 18 in. and under	62.50-63.50
Railroad Specialties	54.00-55.00
Uncut Tires	52.00-52.50
Angles, Splice Bars	53.00-54.00

*Plus applicable freight springboard.

CLEVELAND

No. 1 Heavy Melt. Steel	$39.50-40.00*
No. 2 Heavy Melt. Steel	39.50-40.00*
No. 1 Busheling	39.50-40.00*
Nos. 1 & 2 Bundles	39.50-40.00*
Machine Shop Turnings	34.50-35.00
Mixed Borings, Turnings	34.00-36.00
Short Shovel Turnings	35.50-36.00
Cast Iron Borings	35.50-36.00
Bar Crops and Plate	44.50-45.00
Punchings & Plate Scrap	44.50-45.00
Heavy Turnings	39.50-40.50
Alloy Free Turnings	37.50-38.50
Cut Structurals	46.00-49.00

*Plus applicable freight springboard.

Cast Iron Grades

No. 1 Cupola	68.00-70.00
Charging Box Cast	58.00-60.00
Stove Plate	58.00-60.00
Heavy Breakable Cast	54.00-56.00
Unstripped Motor Blocks	58.00-60.00
Malleable	73.00-78.00
Brake Shoes	52.00-53.00
Clean Auto Cast	68.00-70.00
No. 1 Wheels	58.00-60.00
Burnt Cast	56.00-57.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50-41.50*
R.R. Malleable	73.00-78.00
Rails, Rerolling	57.00-58.00
Rails, Random Lengths	56.00-57.00
Rails, 3 ft and under	61.00-63.00
Cast Steel	56.00-58.00
Railroad Specialties	53.00-55.00
Uncut Tires	56.00-57.00
Angles, Splice Bars	57.00-59.00

*Plus applicable freight spring board.

VALLEY

No. 1 Heavy Melt. Steel	40.00-40.50*
No. 2 Heavy Melt. Steel	40.00-40.50*
No. 1 Bundles	40.00-40.50*
Machine Shop Turnings	34.50-35.50
Short Shovel Turnings	36.50-37.00
Cast Iron Borings	36.00-36.50
Low Phos.	46.00-47.50

* Plus applicable freight springboard.

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50-41.50*

*Plus applicable freight spring board.

MANSFIELD

Machine Shop Turnings	$35.00-35.50
Short Shovel Turnings	37.00-37.50

CINCINNATI

No. 1 Heavy Melt. Steel	$39.50
No. 2 Heavy Melt. Steel	39.50
No. 1 Busheling	39.50
Nos. 1 & 2 Bundles	39.50
Machine Shop Turnings	33.50
Mixed Borings, Turnings	32.50
Short Shovel Turnings	35.50
Cast Iron Borings	34.50

Cast Iron Grades

No. 1 Cupola Cast	55.00
Charging Box Cast	43.00
Heavy Breakable Cast	50.00
Stove Plate	47.00
Unstripped Motor Blocks	45.00
Brake Shoes	45.00
Clean Auto Cast	55.00
Drop Broken Cast	60.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50
R.R. Malleable	68.00
Rails, Rerolling	53.00
Rails, Random Lengths	50.00
Rails, 18 in. and under	60.00

DETROIT

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$35.00-35.50
No. 1 Busheling	35.00-35.50
Nos. 1 & 2 Bundles	35.00-35.50
No. 3 Bundles	35.00-35.50
Machine Shop Turnings	29.00-29.50
Mixed Borings Turnings	29.00-29.50
Short Shovel Turnings	30.00-30.50
Cast Iron Borings	30.00-30.50
Punchings & Plate Scrap	40.00-40.50

Cast Iron Grades

No. 1 Cupola Cast	60.00-62.00
Heavy Breakable Cast	50.00-52.00
Clean Auto Cast	62.00-65.00

BUFFALO

No. 1 Heavy Melt. Steel	$42.00-44.00
No. 2 Heavy Melt. Steel	39.75-40.25
No. 1 Busheling	39.75-40.25
No. 1 & 2 Bundles	39.75-40.25
Machine Shop Turnings	34.75-35.25
Mixed Borings, Turnings	34.75-35.25
Cast Iron Borings	35.75-36.26
Short Shovel Turnings	36.75-37.25
Low Phos.	44.75-46.00

Cast Iron Grades

No. 1 Cupola	65.00-70.00
Mixed Cupola	62.00-65.00
Heavy Breakable Cast	55.00-57.00
Malleable	70.00-75.00
Clean Auto Cast	62.00-64.00

Railroad Scrap

Rails, 3 ft. and under	56.00-58.00
Railroad Specialties	52.00-53.00

PHILADELPHIA

No. 1 Hvy. Melt. Steel	$41.50
No. 2 Hvy. Melt. Steel	39.00
No. 1 Busheling	39.00
Nos. 1 & 2 Bundles	39.00
No. 3 Bundles	37.00
Machine Shop Turnings	34.00-35.00
Mixed Borings, Turnings	34.00-35.00
Short Shovel Turnings	34.00-35.00
Bar Crop and Plate	44.50-45.50
Punchings & Plate Scrap	44.50-45.50
Cut Structurals	44.50-45.50
Elec. Furnace Bundles	43.50-44.50
Heavy Turnings	42.50-43.00
No. 1 Chemical Borings	42.00-43.00

Cast Iron Grades

No. 1 Cupola Cast	62.00-64.00
No. 1 Machinery Cast	66.00-67.00
Charging Box Cast	61.00-61.50
Heavy Breakable Cast	61.00-61.50
Unstripped Motor Blocks	59.50
Malleable	74.00-76.00
Clean Auto Cast	62.00-64.00
No. 1 Wheels	67.00-68.00

NEW YORK

(Brokers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$34.03
No. 2 Heavy Melt. Steel	34.03
No. 1 Busheling	34.03
Nos. 1 & 2 Bundles	34.03
No. 3 Bundles	32.03
Machine Shop Turnings	28.50-29.00
Mixed Borings, Turnings	28.50-29.00
Short Shovel Turnings	30.50-31.00
Punchings & Plate Scrap	39.00-40.00
Cut Structurals	39.00-40.00
Elec. Furnace Bundles	39.00-40.00

Cast Iron Grades

No. 1 Cupola Cast	54.00-56.00
Charging Box Cast	54.00-55.00
Heavy Breakable	54.00-55.00
Unstripped Motor Blocks	51.00-53.00
Malleable	68.00-69.00

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	$31.40-31.90
No. 2 Heavy Melt. Steel	31.40-31.90
No. 1 Bundles	31.40-31.90
No. 1 Busheling	31.40-31.90
Machine Shop Turnings	26.90
Mixed Borings, Turnings	26.90
Short Shovel Turnings	28.90
Bar Crops and Plate	35.00-37.00
Punchings & Plate Scrap	35.00-37.00
Chemical Borings	34.00-35.00

Cast Iron Grades

No. 1 Cupola Cast	55.00-60.00
Heavy Breakable Cast	53.00-55.00
Stove Plate	50.00-52.00
Unstripped Motor Blocks	40.00-41.00
Clean Auto Cast	48.00-50.00

CHICAGO

No. 1 Heavy Melt Steel	$38.50-39.50
No. 2 Heavy Melt. Steel	38.50-39.50
No. 1 Bundles	38.50-39.50
No. 2 Bundles	38.50-39.50
No. 3 Bundles	36.50-37.50
Machine Shop Turnings	33.50-34.50
Mixed Borings, Turnings	33.50-34.50
Short Shovel Turnings	35.50-36.50
Cast Iron Borings	34.50-35.50
Bar Crops and Plate	46.00-47.00
Punchings	47.50-48.50
Elec. Furnace Bundles	39.50-40.50
Heavy Turnings	38.00-39.00
Cut Structurals	43.50-44.50

Cast Iron Grades

No. 1 Cupola Cast	68.00-70.00
Clean Auto Cast	68.00-70.00
No. 1 Wheels	54.00-57.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	41.25-41.75
Malleable	71.00-73.00
Rails, Rerolling	49.00-50.00
Rails, Random Lengths	46.50-47.50
Rails, 3 ft and under.	55.00-56.00
Rails, 18 in. and under	57.00-58.00
Railroad Specialties	49.00-50.00
Angles, Splice Bars	50.00-51.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$39.50-40.50
No. 2 Heavy Melt. Steel	37.50-38.50
Machine Shop Turnings	32.50-33.50
Short Shovel Turnings	34.50-35.50

Cast Iron Grades (Fob shipping point)

No. 1 Cupola Cast	65.00-67.00
Mixed Cast	60.00-62.00
Heavy Breakable Cast	53.00-55.00
Brake Shoes	54.00-55.00
Clean Auto Cast	64.00-66.00
Burnt Cast	58.00-59.00

Railroad Scrap

R.R. Malleable	65.00-70.00
Rails, Rerolling	50.50-52.50
Rails, Random Lengths	49.50-51.50
Rails, 3 ft and under	53.00-55.00
Uncut Tires	46.00-47.00
Angles, Splice Bars	46.00-48.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$37.00
No. 2 Heavy Melt. Steel	37.00
No. 1 Busheling	37.00
Nos. 1 & 2 Bundles	37.00
No. 3 Bundles	31.00
Long Turnings	24.50
Short Shovel Turnings	26.00-27.00
Cast Iron Borings	25.00
Bar Crops and Plate	38.50
Cut Structurals	38.50

Cast Iron Grades

No. 1 Cupola Cast	51.00
Stove Plate	43.00
No. 1 Wheels	45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	38.00
R.R. Malleable	45.00
Axles, Steel	39.00
Rails, Rerolling	52.00
Rails, Random Length	39.00
Rails, 3 ft and under	41.00
Angles and Splice Bars	41.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*$25.00
No. 2 Heavy Melt. Steel	*25.00
No. 1 Busheling	*25.00
Nos. 1 & 2 Bundles	*25.00
No. 3 Bundles	*20.00
Machine Shop Turnings	*15.50
Bar Crops and Plate	25.00
Cast Steel	25.00
Alloy Free Turnings	15.50
Cut Structurals	25.00
Tin Can Bundles	20.00

Railroad Scrap

No. 1 Heavy Melting	26.00
Axles	32.00
Rails, Random Lengths	26.50
Uncut Tires	33.50

* Fob California shipping point

SEATTLE

No. 1 Heavy Melt. Steel	$26.00
No. 2 Heavy Melt. Steel	26.00
No. 1 Busheling	26.00
Nos. 1 & 2 Bundles	22.00-23.00
No. 3 Bundles	22.00-23.00
Machine Shop Turnings	14.50-16.50
Mixed Borings, Turnings	14.50-16.50
Punchings & Plate Scrap	26.00-28.00
Cut Structurals	26.00-28.00

Cast Iron Grades

No. 1 Cupola Cast	40.00
Charging Box Cast	25.00
Heavy Breakable Cast	24.00
Stove Plate	25.50
Unstripped Motor Blocks	24.00
Malleable	30.00
Brake Shoes	30.00
Clean Auto Cast	30.00
No. 1 Wheels	26.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	22.00
Railroad Malleable	30.00
Rails, Random Lengths	21.50
Angles and Splice Bars	23.00

LOS ANGELES

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	25.00
Nos. 1 & 2 Bundles	25.00
Machine Shop Turnings	16.00
Mixed Borings, Turnings	15.50-16.00
Punchings & Plate Scrap	28.00
Elec. Furnace Bundles.	28.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00

HAMILTON, ONT.

(Ceiling prices, delivered)

Heavy Melting	$22.00
No. 1 Bundles	22.00
Mechanical Bundles	20.00
Mixed Steel Scrap	19.00
Mixed Borings, Turnings	17.00
Rails, Remelting	28.00
Rails, Rerolling	26.00
Bushelings	17.00
Bushelings, new factory, prep'd	21.00
Bushelings, new factory, unprep'd	16.00
Short Steel Turnings	17.00

Cast Iron Grades*

No. 1 Cast	42.00-48.00
No. 2 Cast	35.00-37.00

* Removed from price control Aug. 9, 1947; quoted on basis of fob shipping point.

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Presses for Sheet Scrap

THE NATION NEEDS YOUR SHEET SCRAP!

In mills, industrial plants and scrap yards, LOGEMANN SCRAP PRESSES are working day and night to prepare sheet scrap for the furnaces.

Sheet mills particularly recognize the value of the years of experience and the performance records which back up LOGEMANN designs and workmanship.

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3126 W. Burleigh St. **Milwaukee, Wisconsin**

The scrap press illustrated operates in one of the largest industrial plants. Compresses scrap from three directions to produce high-density mill size bundles. Built in various capacities.

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Valuable man-hours... in the danger zones of plants and factories

A SLIPPERY floor, a hurrying worker . . . painful injuries and lost man-hours. This is a story that occurs too often in too many plants—and needlessly so! You can keep injuries due to slips and falls to a minimum by installing U·S·S Multigrip Floor Plate in your plants.

Multigrip is easily cleaned. It drains freely in any direction. It has no pockets in which dirt and water can accumulate. It offers skid resistance and traction in every direction, wet or dry!

Multigrip has no gutters in which a thin-tired wheel may catch. Wheels roll smoothly and efficiently *on* the risers, not *between* them. The risers are comfortable underfoot, lessen fatigue. For surer footing for workers, easier rolling for vehicles, install U·S·S Multigrip Floor Plate in your plants.

Get further information about Multigrip from your nearest steel warehouse or write to us.

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Pittsburgh and Chicago

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*
Tennessee Coal, Iron & Railroad Company, Birmingham, *Southern Distributors*
United States Steel Export Company, New York
S-168

UNITED STATES STEEL

Sheets, Strip . . .

Severe cutbacks in production of flat-rolled items getting under way

Sheet Prices, Page 138

Pittsburgh — Sheet and strip production schedules were well sustained last week, and it is hoped present operations can be maintained for another week to 10 days. Increased pressure for deliveries continues with customers attempting to obtain commitments before indicated disruption to rolling schedules occurs. Prior to the coal strike, there was a growing opposition on part of metalworking purchasing agents to resist exorbitantly priced steel obtained through conversion deals. However, this trend has been reversed in recent weeks. Sellers have established second quarter production schedules without making any allowance for threat of disruption to production resulting from the coal strike.

Philadelphia — Severe cutbacks now are appearing in sheets and strip, the products in most stringent demand since the end of the war and the last of the major items to have been hard hit by the current coal strike. It is still too early to estimate the extent of the reduction in current quarter quotas, but there is little question now but that it will be substantial.

Chicago — Demand for sheets and strip continues unabated, despite indications recently that possibly some diminution in requirements seemed possible before yearend. The coal strike appeared to result in some consumers increasing pressure for deliveries, but in spite of this many users maintain present quotas are inadequate. A steel company which engages in conversion of semifinished recently opened its books for this business in second half and now reports that requests for space exceeded capacity to roll. Furthermore, some of the softness in gray market prices for flat-rolled products seems to have been arrested.

Cincinnati — Sheet mill production is being maintained in normal volume, although the banking of a blast furnace several weeks ago in Martins Ferry which supplies Newport, Ky., mills of the International Detrola Corp. indicates that curtailment is close unless an adequate coal supply is restored quickly. Mills are sticking to previously announced second quarter allotments, but the near view is clouded by potential contingencies which may force modifications in schedules.

St. Louis — Sheet output is expected to continue unchanged here at least another week, but production thereafter will depend on the tonnage of cold pig iron obtainable from outside sources, a rather dismal prospect. Rollers here use hot iron almost exclusively. Granite City Steel Co.'s new cold reduction mill still operates at about 40 per cent of capacity due to difficulty with auxiliary equipment, principally the cleaner line. The company recently has been accepting few new orders, in an effort to get current. Shipment on sheets scheduled originally for April delivery probably will be made in June or July. There will be a big carryover into

the third quarter, which prevents estimates of tonnage available for sale in that period. Order books are less congested now, but pressure for deliveries is unremitting. Currently, from 5 to 10 per cent of sheets are earmarked for Greece, Iceland, Turkey and the domestic carbuilding program. Should this be augmented by government pressure for pipeline, oil field and agricultural machinery steel, mills fear shipments for other products may fall considerably.

A few fabricators are laying off employees because of their customers' fear the steel outlook may affect suppliers of metal products they use other than sheet steel. Wagner Electric Corp., appliance and motors maker, for example, has laid off 300 men because of canceled orders. Other manufacturers whose markets are affected by worse steel shortages elsewhere, will follow suit soon.

Steel Bars . . .

Bar Prices, Page 138

New York — Alloy bar demand continues to expand, and while electric furnace alloy deliveries can be had as early as June in some instances, the position on open hearth alloys is considerably more extended. Certain producers have nothing in the open-hearth alloy grades to offer before August.

Defense work has not as yet been reflected much in local demand, although district selling offices report that their home offices are receiving an increasing amount of this work directly from government agencies and that the general indications are these requirements will broaden considerably as time goes on regardless of whether or not hostilities develop.

Retooling programs also are being discussed and this shortly should lead to an improvement in tool steels. This should be reflected ultimately in increasing demand for tungsten, vanadium, and certain other such alloys.

Pittsburgh — Demand for alloy bars continues to increase, deliveries for open-hearth grades now extending three to four months. Growing tightness in alloy bar supply is expected to be further accentuated due to the disruption of production resulting from the coal strike. Carbon bar sellers also expect delivery schedules to be disrupted which in turn probably will retard output of cold-finished bars in the near future. Both alloy and cold-finished bar producers report a slight increase in so-called "scare" ordering, reflecting effort on the part of consumers to obtain as much steel as possible before mill distribution of finished steel output is rejuggled because of coal strike and to meet essential requirements of preferred civilian goods industries and for ERP. There is also a good prospect that greater finished steel tonnage will be channeled into military programs over the coming months. Carnegie-Illinois Steel Corp. has shut down one bar mill at the Duquesne Works.

Philadelphia — Sharp curtailment in bessemer steel production is having a particularly noticeable effect on cold-drawn bar supply, and especially in the small sizes. Some cold drawers estimate that their delivery promises will be set back at least

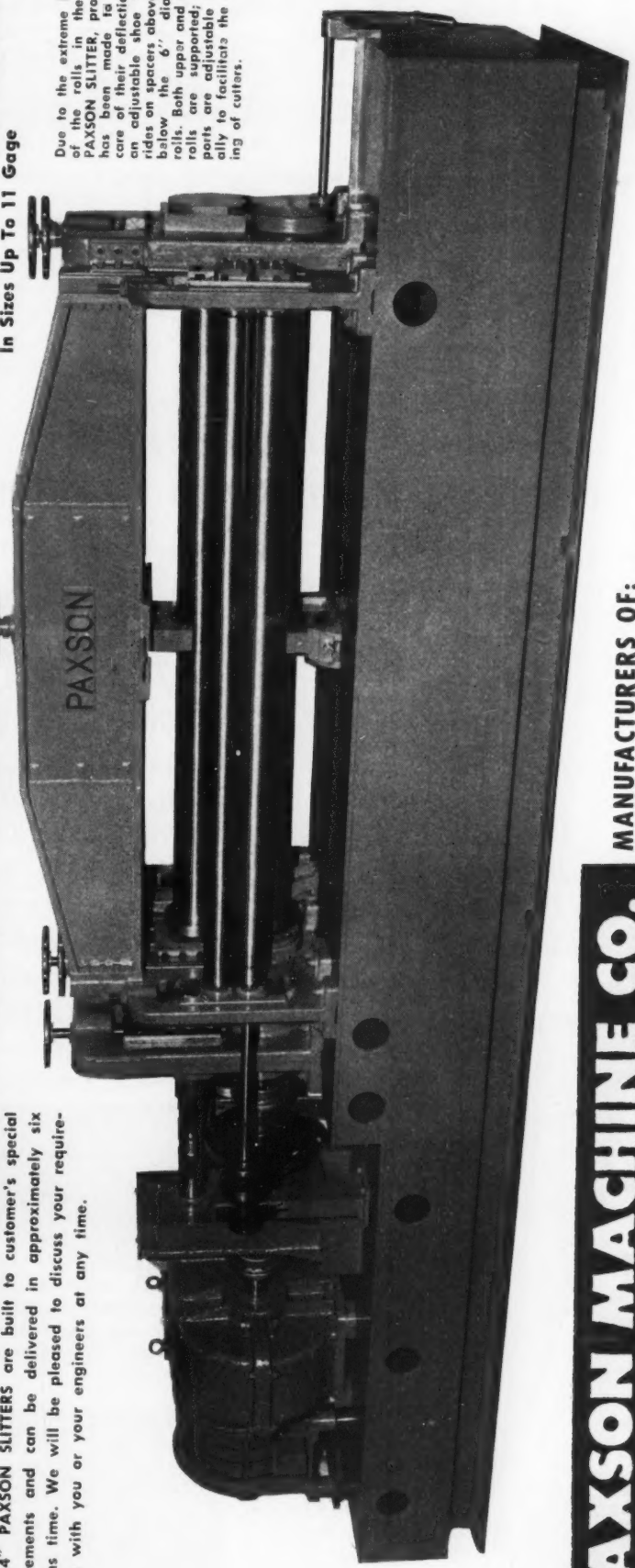
84" PAXSON SLITTER

CAN BE BUILT FOR SPEEDS OF 50 TO 150 FT. PER MINUTE

In Sizes Up To 11 Gage

All 84" PAXSON SLITTERS are built to customer's special requirements and can be delivered in approximately six months time. We will be pleased to discuss your requirements with you or your engineers at any time.

Due to the extreme length of the rolls in the 84" PAXSON SLITTER, provision has been made to take care of their deflection by an adjustable shoe which rides on spacers above and below the 6" diameter rolls. Both upper and lower rolls are supported; supports are adjustable laterally to facilitate the spacing of cutters.



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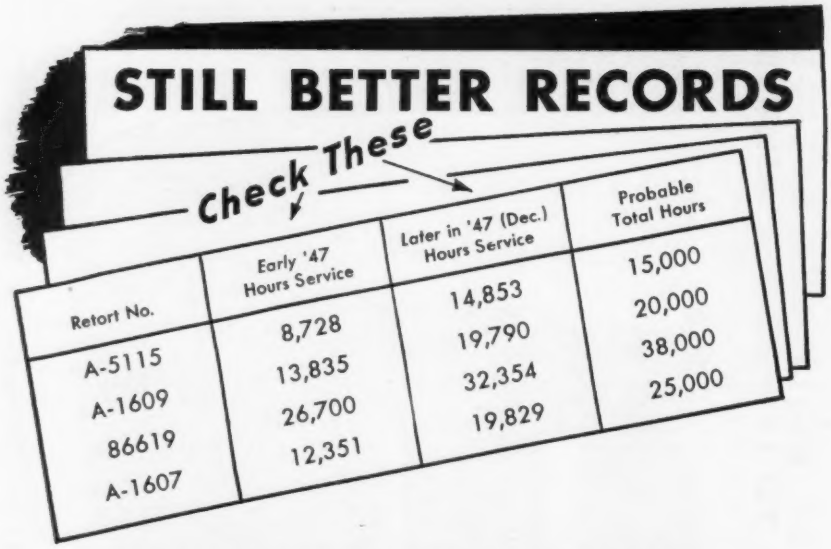
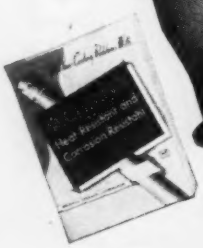


MICHIANA ALLOY RETORTS INCREASE HEAT-HOUR SERVICE

Early in '47 records of MICHIANA Heat-Resistant Alloy Retorts in an eastern plant showed total hours as high as 26,700. A mid-summer check showed one of these retorts had served over 32,000 hours with prospects of running to 35,000 or more.

When a half dozen of these were installed late in '46, a 15,000-hour service was considered excellent. Four have since passed the 15,000-hour mark, two have hit the 20,000 mark and one, as mentioned above, already has exceeded 30,000 hours.

For economy, fewer delays and long time service, you can rely on the uniform quality of MICHIANA Alloy Pots, Retorts, Muffles, Boxes, Trays. Recommendations promptly made. MICHIANA PRODUCTS CORPORATION, Michigan City, Indiana.



Type of MICHIANA Retort as used in eastern plant for calcining paint pigments.

This 3500-pound Retort of MICHIANA Heat-Resistant Alloy, designed with internal spiral flights or ribs, is used in the heat-treating of small metal parts.

Send for your copy of Bulletin 110 today.

MICHIANA
Heat-Resistant and Corrosion-Resistant ALLOY CASTINGS

three weeks, with the probability that schedules will be further delayed before the coal dispute is settled. Curtailment in open-hearth carbon bar production is causing some producers to blank out an entire month's quota; those not taking similar steps face the prospect of carrying over substantially greater arrearages at the end of this quarter than at the close of the last quarter.

Plates . . .

Plate Prices, Page 139

Philadelphia — Pressure for plates is increasing. This is due not only to curtailment in production because of the coal stoppage, but to expanding requirements of the public utilities and oil industry, and also to the recent spurt in shipyard requirements. Steelmakers are now being asked to figure on 33,500 tons for five combination passenger and cargo ships for the American President Lines, on which shipbuilders bids are to be closed Apr. 30 by the United States Maritime Commission, and on 30,000 tons for two liners for the American Export Lines, on which bids are scheduled for June 7. Bulk of these tonnages is plates. Also, 24,000 tons of plates, shapes and bars may be required later for a liner of 48,000 tons displacement for the United States lines. Gibbs & Cox, New York, has completed plans, but at the moment it is not certain whether the Maritime Commission will build the ship and then lease it out on charter, or the United States lines will build it, with aid of a construction subsidy.

Shortage of power throughout the country is placing special emphasis on public utility requirements, particularly large generators and other electrical assemblies, which require some months to complete.

Pittsburgh — Shutdown of the 100-inch plate mill at Carnegie-Illinois Steel Corp.'s Homestead Works last week, due to coal strike, has further accentuated the already unbalanced supply-demand relationship of this product. Most plate sellers entered second quarter with substantial carryovers, but have not set aside any specific period this quarter to make it up because of production uncertainties. The carryover probably will not be made up until some time in third quarter.

Seattle — Plate fabricators are operating under the restriction of inadequate supplies, the situation becoming more acute daily. No large projects involving plates are up for figures, routine boiler and tank jobs requiring small tonnages being the rule.

New York — Shipyard demand for plates is expanding, with the trend expected to continue for some time. Bethlehem Steel Co. has closed on four super-tankers, described as the largest in the world, for erection at its Quincy, Mass., yards for the Texas Co. These vessels will be 595 feet long, with a beam of 84 feet.

Plate producers also are feeling increasing pressure for tonnage from the oil and gas industries. It is considered likely that voluntary allocations will have to be set up on steel for these industries, although not on the basis estimated by these consumers of around 8,000,000 tons a year, or well more than twice the amount

these industries received in 1947.

Interest centers on U.S. Maritime Commission now taking bids on five 13,500 gross ton combination passenger and cargo ships for the American President Lines, with tenders to be in by Apr. 30, and for two 29,705 displacement ton liners for the American Export Lines, with tenders to be closed June 7. Plans also have been completed by Gibbs & Cox, this city, for a 48,000 gross ton liner for the United States Lines Co. It is not certain at present whether the United States Lines will have the ship built with the aid of a construction subsidy, or whether the United States Maritime Commission will build the ship and then lease it out on charter. The ship is for North Transatlantic passenger service, although careful consideration has been given to the possibility of having to convert the vessel into a troop carrier in emergencies. The ship would have a capacity of about 12,000 troops, it is said.

Tubular Goods . . .

Tubular Goods Prices, Page 139

Boston—Demand for steel pipe is far in excess of supply and allocation. Utilities are exerting strong pressure for increases in allocations, but there is slight chance for any improvement in the third quarter. Allocations for that period will be announced soon. The petroleum industry is seeking heavier tonnage under voluntary distribution and any additional volume going to that field will be at the expense of other consumers. Larger storage capacity also is stimulating demand for pipe. Shops fabricating pipe are sold through 1949 in some instances, based on expected quotas. Distributor volume is at least equal to last year's rate, despite the truck strike earlier this year. This is due partly to deliveries against old orders as new orders are slightly smaller. Cold-drawn mechanical tubing deliveries have lengthened.

Pittsburgh — Seamless pipe output at the McKeesport Works of National Tube Co. established a new record during March, exceeding any previous monthly period by 6575 tons. This record showing, however, probably will be more than offset this month due to the indicated reduction in operations resulting from the coal strike. Supply of seamless and butt weld pipe is expected to remain well below stated requirements for months to come. In the case of seamless, sellers are booked into 1952 in the large diameters. There is also very little prospect of improved supply-demand relationship of tubing items through most of this year. Sellers note moderate tightening in delivery schedules for both stainless and alloy tubing.

Cleveland — Inquiries for pipe, pumps and other equipment for rehabilitation of government-owned ordnance plants have been received here. Unable to provide the pipe out of its near-term production but desiring to help the government procurement efforts, one pipe producer began checking with warehouses for available supplies.

Seattle — There is little interest in the cast iron pipe market. Agencies are handicapped by inability to deliver in less than 24 months and considerable business has been lost to competing types.

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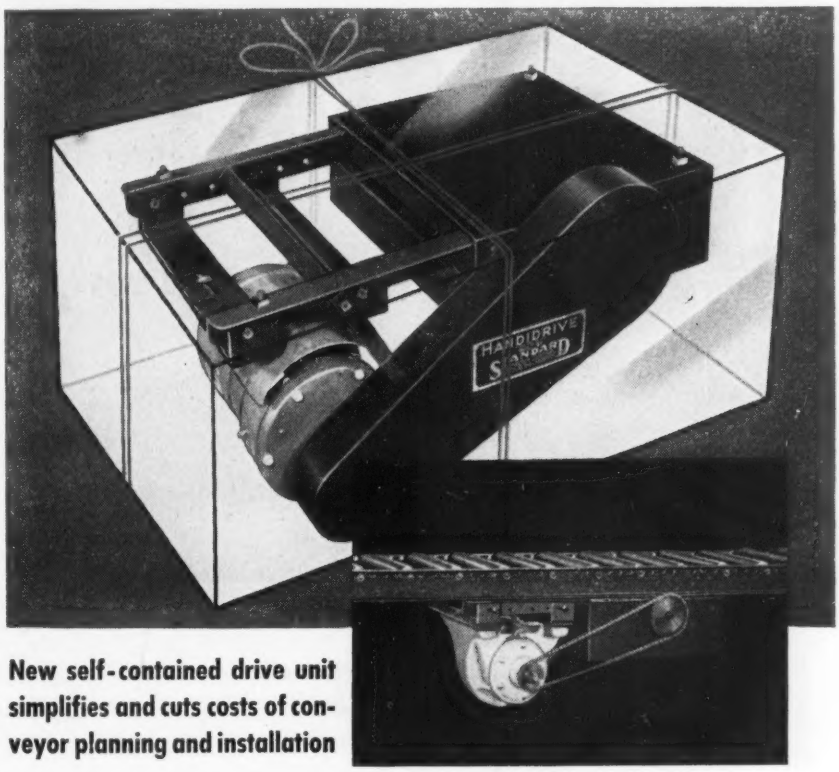
HANDI-DRIVE

. . a "power package" unit for all types of roller and belt conveyors



New self-contained drive unit simplifies and cuts costs of conveyor planning and installation

Here it is! A packaged power unit that gives every conveyor user the opportunity to be his own layout engineer — to change his conveyor system to suit varying plant conditions in a minimum of time!

Converts gravity conveyors to live belt or roller conveyor quickly . . at low cost

The Handi-Drive is a self-contained drive unit for applying tractive power to gravity conveyor belt or rollers. Equally important, using standard units you can build a conveyor system custom-planned to your individual plant needs. Standard units are stocked at the factory — you can get them now!

If you want to convert your present gravity conveyors to powered units — or if you want to install your own new system . . . send for the Handi-Drive Bulletin No.ST-48. It gives you complete design information and prices — tells you how to lay out your system, gives complete data on inclines, belt and roller widths, curves, weights to be handled and types of packaging or units to be moved. Write: Standard Conveyor Company, North St. Paul, Minnesota.

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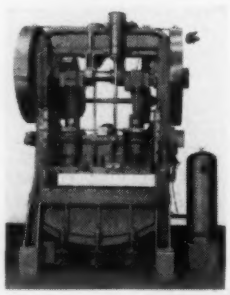
All WILLIAMS-WHITE Production Machines ARE TRULY CUSTOM BUILT

Pierre DeCooman and Al Van Meighem, molders at WILLIAMS-WHITE & CO., together have more than 60 years experience in the foundry.

The skill and knowledge born of years of experience go into every step in the production of WILLIAMS-WHITE machinery. From the blue-print stage through the foundry and on to the assembly floor, your machine is in the hands of experienced craftsmen.

Every WILLIAMS-WHITE machine is individually built to your specifications. Write us, giving as much detail as possible regarding the machine in which you are interested and we will send full specifications, with no obligation on your part.



PRESSES, SHEARS, HAMMERS
PUNCHES, ROLLS

MAKERS OF PRECISION PRODUCTION TOOLS FOR NEARLY 100 YEARS

WILLIAMS-WHITE & CO.
MOLINE, ILLINOIS

Tin Plate . . .

Tin Plate Prices, Page 139

Pittsburgh — Output of tin mill products has been well sustained to date in contrast with cutbacks in other finished steel production schedules. However, no one is willing to predict how long full scale tin mill operations will continue, although it is believed near-capacity output can be sustained for at least another week. If the coal strike continues much longer, additional reduction in movement of tin mill products via rail is inevitable, making it necessary to resort to greater use of truck transportation. Tin plate producers enter second quarter with relatively little carryover tonnage compared with other steel products. However, this is not true of all producers, for one interest is reported to have blocked out May production schedules to make up this carryover tonnage. Since terne plate prices applicable for containers have been established for this year, they will not be affected by the 2-1/2-cent per pound advance in primary lead.

Chicago—Inland Steel Co. last week resumed partial operation of its tin mill department, following a two-week shutdown caused by shearmen walking off the job in a dispute. Although the shearmen still are remaining away, the company restarted the electrolytic lines on a restricted schedule but is holding the hot-dip lines idle.

Structural Shapes . . .

Structural Shape Prices, Page 139

Philadelphia — Shape production is slumping rapidly, as a result of the continued tie-up at the coal mines. One leading unit is reported to be operating at less than 50 per cent, with a further curtailment in prospect. Fabricating shops are feeling the stringency, and are quoting deliveries on a more conservative basis. Meanwhile, local district building demand is light.

Boston—While deliveries of fabricated structural steel are extended six to seven months with some larger shops, smaller units are able to take limited tonnage contracts for shipment earlier and are booking a fair volume on that basis. There is no easing in the plain material situation and several mills likely will blank out at least one month in the third quarter. District fabricators' inventories are somewhat improved, although lacking balance.

As the contract is scheduled for award by July 1, bids on the first lot of 13,000 tons for the East Boston express-way will be taken within the next few weeks; steel will be covered in two contracts of 8000 and 5000 tons each.

Chicago—New structural steel fabricating business is coming out slowly. This is a matter of little concern at the moment, for shape supply is the controlling factor in shop operations. However, some concern is being expressed as to whether reduced inquiries suggest that the latter part of the year may prove to be dull. Most shops have enough work to keep them busy through third quarter. Whatever may be undertaken in national defense in the future, it is

regarded as certain that it will involve little in the way of new building construction.

Seattle — Fabricators face increased difficulties due to the coal strike. Report here is that because of fuel lack Geneva Steel Co.'s plant is about to close. This would aggravate the situation in the Pacific northwest served by that mill. Eastern mills are deferring shipments because of the coal shortage and the immediate future is not promising.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 138

Chicago—Volume-wise, demand for reinforcing steel is comparatively quiet, yet suppliers, handicapped by shortness of steel, report they are offered more business than they can handle. Few inquiries involve more than a few hundred tons, but in most cases bids are not made because delivery dates can not be met. Volume of small jobs, requiring only a few tons each, are numerous and comprise a good part of business of suppliers. There is little prospect that steel supply will ease appreciably in the next six months.

Seattle — Reinforcing continues in urgent demand, mills being swamped with orders for small tonnages, many of them for school construction ranging from 20 to 50 tons each. Total volume is of large proportions. Backlogs continue static with new business equalling production and mills making every effort to expedite deliveries. Northwest Steel Rolling Mills, Seattle, is on a four-day weekly rolling schedule as the furnaces, handicapped by poor scrap, cannot turn out ingots to permit full time rolling. Within 60 days Bureau of Reclamation, Denver, will receive bids for 24 miles of canals and the Soap Lake siphon, Columbia Basin project, involving about 5500 tons reinforcing.

Hamilton Foundry Freezes Prices for Second Quarter

Hamilton, O.—Hamilton Foundry & Machine Co., has advised its customers that prices quoted by the company since Jan. 1, 1948, are continued in effect for shipments up to and including June 30, 1948. The company is absorbing for the period the rate increases in wages, which became effective Mar. 1 under a new agreement with the International Molders & Foundry Workers union, and such other salary adjustments that will follow. Another review of the situation will be made by the company at the start of the second half of the year.

Semifinished Steel . . .

Semifinished Prices, Page 138

Pittsburgh — Shipments of semifinished steel to nonintegrated interests have been the most adversely affected of all steel product shipments, resulting from curtailment to steelmaking production schedules due to coal strike. Full extent of this curtailment is expected to develop next week should the coal strike continue.

HOW TO SABOTAGE A SHAFT

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Pig Iron . . .

Miner's walkout forces sharp curtailment of blast furnace operations

Pig Iron Prices, Page 140

Philadelphia — Pig iron production continues to decline because of the coal strike, with a further drop expected before there is a turn for the better. All producers feeding this district have reduced their output, and in the case of the two Swedeland, Pa., furnaces, they have been slowed down to about 50 per cent of normal. Originally, the smaller of the two stacks was to have been taken off Apr. 3, but subsequently it was decided to halve the output of both furnaces, so as to be in position for a more speedy return to normal in the event the coal situation suddenly cleared up. As a matter of fact, this policy of operating furnaces on reduced draft has been more general than upon previous occasions of this character. However, various furnaces have not only been banked in some cases, but blown out completely in others, and before the coal dispute is settled others will probably be added to the list.

While foundry production has been severely handicapped, operators have done a surprisingly good job in keeping casting production from declining more than it has. Despite shortages of coke and pig iron, they have been able to bolster output by the judicious use of alloy briquettes, anthracite coal and other materials. Anthracite miners are now out in sympathy with the soft coal miners, but there is ample hard coal above ground to keep the foundry operators from suffering on this score for some time.

Pig iron supply last month was bolstered by the arrival of two shipments of Dutch iron, one coming into Philadelphia on Mar. 8 and the other on Mar. 23, and each comprising about 2750 tons of basic. It is understood that this iron was in exchange for plates.

New York — The Chester, Pa., blast furnace operated during the war by Pittsburgh Ferromanganese Corp., has been purchased from the government by Atlas Steels Inc., Wilmington, Del. The company is headed by Walter K. Hart, president, Girard Life Insurance Co., Philadelphia, and Arthur H. Hunter, New York. Purchase price was $275,000. The property comprises 12 small buildings, in addition to the stack, and 11-1/2 acres. Necessary repairs are estimated at from $200,000 to $500,000. It is said Spanish ore will be used in the furnace.

Pittsburgh — Output of merchant pig iron has been curtailed sharply in the past ten days due to the banking of two furnaces by one integrated producer here. Output of the lone merchant iron stack of an independent producer has been below rated capacity for some weeks now. A number of foundries have been forced to curtail operations due to depleted pig iron and coke inventories, and in a few instances some of the smaller interests have been forced to close. No definite decision has as yet been reached in regard to whether or not pig iron sellers will be asked to meet preferred tonnage directives for key industrial groups other than tonnage involved for the railroad car program. By close of last week, 8 blast furnaces in this district had been banked due to the coal strike. Three additional units are down for relining.

Cleveland — Outlook for foundry operations continued to darken last week as the coal miners' work stoppage cut supplies of coke and pig iron. With both having been in tight supply for some time, the stringency was amplified quickly and extended further into the future. The next six to eight weeks are expected to be marked with extreme difficulties of operation. Already, many foundries are working only four days a week because of insufficiency of iron and coke. In an effort to keep foundries in operation, some purchasers of castings are supplying coke while the operators are buying iron from the West Coast and Belgium.

With coke production last week down 25 per cent below that of the first week of April, allocation of coke had been reduced approximately that amount. Coke quality was reported down as a result of use of stockpiled coal.

One result of the coal strike was the blowing out here last week of American Steel & Wire Co.'s "B" blast furnace, thereby cutting the merchant iron supply further. During the shutdown, repairs, which had been scheduled for later in the year, will be made. The furnace, one of the company's two here, has a daily rated output of 655 tons, 43 per cent of the company's Cleveland capacity.

Pig iron prices at Cleveland re-

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mained unchanged, but Republic Steel Corp. reported a $2.12-1/2 drop at Buffalo, where its prices are related to price of No. 1 heavy melting steel scrap.

Chicago — Within the next four weeks, foundries will feel the effect of the prolonged coal strike through shortage of both pig iron and coke. Up to now, shipments of these materials have been maintained surprisingly well, but now blast furnaces and coke ovens are due to go down rapidly. After the coal walkout ends, resumption of normal operations will take some time at considerable cost of production By end of last week, operating blast furnaces were scheduled to shrink from 37 to 34 and drastic curtailments are imminent for this week. Also several batteries of coke ovens are due to come off. End of the coal strike would bring modification in these plans, but to what extent cannot be appraised now.

Buffalo — District pig iron output plunged further last week as Bethlehem Steel Co.'s Lackawanna plant shut down two additional blast furnaces, making a total of three out of six down because of the coal strike. The actual production rate was 59.5 per cent as Bethlehem also reduced the wind on three active stacks, cutting production in half. Coke operations were also reduced. All furnaces are on basic iron. A merchant stack was shut down by Hanna Furnace Corp. for relining. This producer, however, plans to curtail operations because of the coal strike.

Cincinnati—Shipments of merchant iron into this district have declined this month to a mere trickle. Furnaces, beset by stoppage of coal supplies, are apparently not trying to meet announced allotments. The foundry melt is sagging badly although some sources of oven foundry coke so far have been meeting commitments from reserves.

St. Louis — Pig iron output has dropped 20 per cent here due to the coal strike, forcing blast furnaces to use a poor quality of coking coal. Coke oven operations have dropped 30 per cent for the same reason. Most of reserve coke stocks have been used and furnaces are depending on coke from northwest and eastern points to fill in the gap. The iron deficit, which is expected to grow no worse for at least two weeks, is being prorated equally among consumers. Melters were warned last week, however, Missouri-Illinois Furnaces Inc. will shut down one of its two 500-ton furnaces in July for relining.

Warehouse . . .

Warehouse Prices, Page 141

Philadelphia — Warehouse distributors report a falling off in incoming tonnage from the mills, as a result of the coal tie-up. In some cases this has not yet resulted in a shrinkage in sales, but is expected to before the month is over, with the effect to be felt in May business as well, regardless of how soon the miners may go back to work.

Cincinnati—Mill shipments to warehouses have been sustained without apparent effect from the coal mining stoppage. Customers, however, sensed impending curtailments and increased the tempo of their shopping only to discover, as usual, inadequate supplies in scarce items.

February Alloy Output Eases to 637,468 Tons

Record February production of steel, totaling 6,940,210 tons as revised, included 637,468 tons of alloy steel and 915,286 tons of hot-topped carbon ingots against 682,240 tons and 987,012 tons, respectively, in January, according to the American Iron & Steel Institute. Production in February consisted of 6,245,344 tons of open-hearth steel, 340,596 tons of bessemer ingots, and 354,270 tons of ingots and steel for castings from electric and crucible furnaces.

Distribution of February output by districts was as follows: Pittsburgh-Youngstown, 2,779,009 tons; Chicago, 1,505,585 tons; eastern, 1,348,212 tons; Cleveland-Detroit, 578,800 tons; western, 379,291 tons; and southern 349,313 tons. Operations ranged from 99.6 per cent of capacity in the Birmingham district to 92.1 per cent in the eastern district and averaged 93 per cent for the month.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 140

Pittsburgh — Nearly all major steel producers sharply reduced oven foundry coke operations at the close

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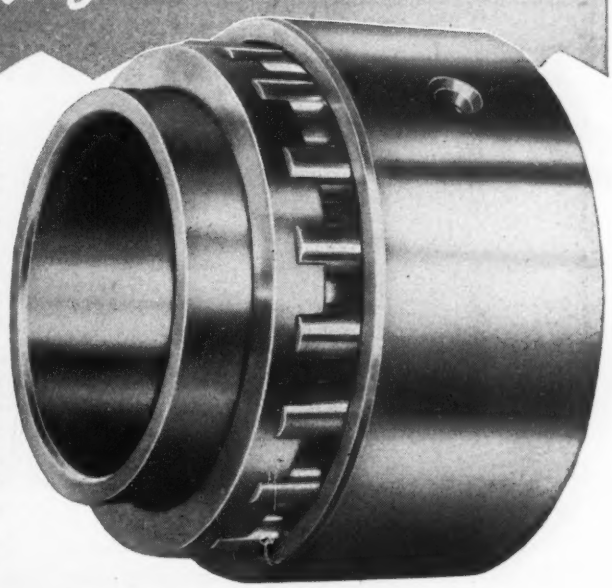

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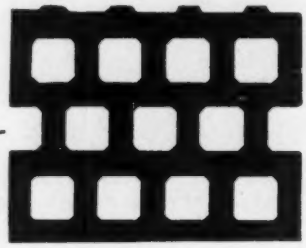

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of last week due to dwindling soft coal inventories resulting from the coal strike. Clairton Works of Carnegie-Illinois Steel Corp. were operating at 70 per cent of capacity near close of last week, while similar reductions were also noted at Midland, Pa., plant of Crucible Steel Co., Pittsburgh Steel Co., and other interests. A number of foundries in this area have been forced to shut down because of depleted coal and pig iron inventories. This situation is expected to become more widespread this week should the coal mine walk-out continue.

Scrap . . .

Mixed price trends developing as melters stretch iron stocks and scrap comes out

Scrap Prices, Page 144

Philadelphia — Notwithstanding the fact that steel scrap has been moving more plentifully and that consumers have been able to build up their stocks, prices have switched to the strong side, a somewhat puzzling development under the circumstances, in the opinion of some trade leaders. No. 1 heavy melting steel actually is higher at $41.50 to $42.50, delivered, with other steel grades unchanged, but definitely strong.

Some leading cast grades, on the other hand, are easier, due to reduced operations of the foundries and the disposition of operators to buy from hand-to-mouth rather than stock cast scrap at prices so abnormally high. Cupola cast has dropped to $62 to $64, delivered; unstripped motor blocks, to $59.50; clean auto cast, to $62 to $64. Charging box cast and heavy breakable are up slightly, however, as the mills are still pressing for tonnage. These grades are now holding at $61 to $61.50, delivered.

Pennsylvania railroad closes bids Apr. 12 on 40,310 tons of miscellaneous scrap, by far the largest monthly offering in recent years and reflecting undoubtedly the special scrap drive the railroads have been putting on, a drive that terminates officially on Apr. 12.

Cleveland — Consumers continued to buy scrap last week but were becoming increasingly puzzled as to what their policy should be in view of the stifling effects of the coal miners' work stoppage. Prices remained unchanged. Thus far, the mining disruption has spurred the purchasing of scrap to stretch dwindling supplies of hot metal in open-hearth steelmaking. However, this increased demand has been met by an enlarged flow of scrap, thus tending to keep prices from rising. The current week's developments in the miners' work stoppage possibly will determine the near-term demand for scrap and, consequently, whether scrap prices will hold or drop.

Pittsburgh — Scrap shipments have not yet been adversely affected by ODT's order to cut steam freight hauls by 25 per cent. Mills are hopeful of augmenting scrap inventories during the period of reduced steel operations. While no new buying of significant scrap tonnage is noted, there has been no cancellation of unshipped tonnages on old orders that

have expired. Small lot commitments recently placed are on a 30-day delivery basis. It is contended that prolonged curtailment in ingot operations will have a weakening effect on current scrap prices. Steel producers have curtailed ingot output in direct proportions with cutbacks in coke and pig iron schedules with the result open-hearth scrap consumption has been similarly reduced. However, despite poor quality of turnings available to the trade, some interests have increased proportion of this item in blast furnace operations. Increased demand for turnings with consequent tightening in supplies has forced a slight upturn in prices to the range of $37 to $37.50. Similarly, foundries are using greater proportion of cast scrap in their melting operations to offset the pig iron shortage, a few as high as 95 per cent. Resultant increased scarcity of cast scrap items has forced prices still higher, with some small lot sales of No. 1 cupola reported as high as $70, delivered. Depleted coke inventories have forced some foundries to shut down, while the bulk of others are operating on restricted schedules. Recent railroad scrap drive appears to have brought results. A moderate increase in tonnage of rails has been noted.

New York — Scrap brokers have reduced buying prices for No. 1 cupola cast to $54-$56, on unstripped motor blocks to $51-$53 fob shipping point. Steel scrap is strong but unchanged, with mills pressing for tonnage notwithstanding the further sharp decline in melting operations.

Buffalo—Despite further sharp setbacks in ingot operations, underlying steadiness continues to rule the scrap market. Dealers report leading mill consumers are pressing for immediate delivery on outstanding orders. It is also pointed out that scrap consumption remains high despite lower ingot output because of the sharp cut in basic iron output. Mills' scrap reserves are also at a low ebb and efforts are being made to replenish supplies.

Dealers feel confident that additional orders will be forthcoming from mills at the formula price of $39.75 for No. 2 heavy melting as soon as old contracts are cleared. More moderate weather has brought out an increased flow of material, which is moving readily toward consumers.

Turnings are moving in a somewhat unsettled market created by a marked cut in bids by Niagara Falls consumers. However, they continue to move on the formula basis in the immediate local market and prices are unchanged. Strength in cast scrap continues with prices holding at recent peaks.

Chicago — With the steel producing industry on the threshold of drastic curtailment because of the continued idleness of coal miners, the scrap market here was lacking in newsworthy developments Mills are accepting all material shipped to them under existing contracts and are showing no disposition to negotiate new contracts for large volume. Prices are steady. Foundries have eased off in their acquisition of material because sharply scaled down operations now appear inevitable due to shortage of both coke and pig iron. Several weeks may be required to get steelmaking and foundry operations back to normal after the coal strike ends, and during

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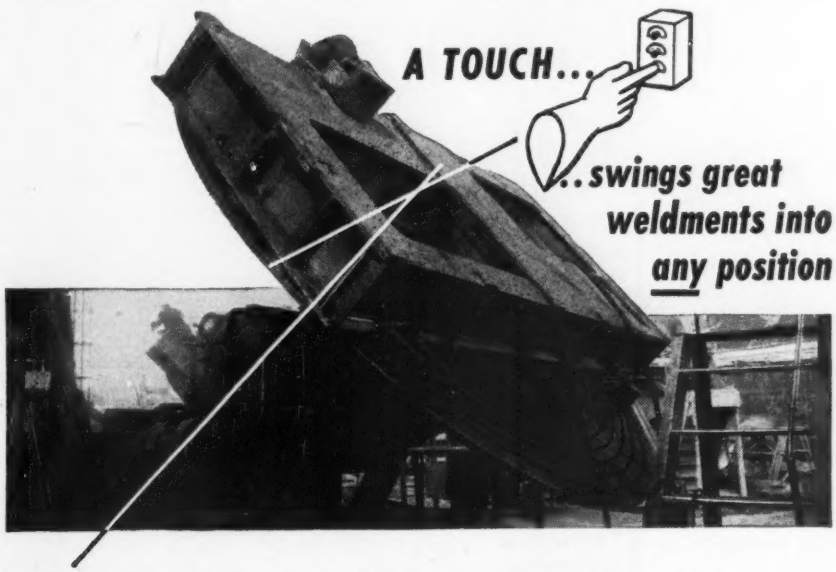

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this period the pressure is likely to be off of scrap.

Cincinnati — Scrap prices were well maintained in this district last week even though curtailment in steelmaking may be forced by the loss of coal production. Demand for foundry grades is off, reflecting a sharp decline in the melt because of pig iron and coke shortages. Hence, there is an easier supply situation without building of reserves to a point where prices are forced downward.

St. Louis — Scrap prices remain firm despite substantially better shipments to brokers. Major consumers are taking all tonnage on old orders, but some are reluctant to place new ones. Mill and foundry inventories are 30 days or better. At least one large melter intends to build ground stocks to the 90-day level, and the general goal of all appears to be at least a 60-day stockpile. There are complaints scrap quality is poor, although better than a year ago.

Seattle — Receipts of steel scrap at tidewater are increasing due in some degree to better weather in the interior, substantial shipments coming from eastern Washington and Idaho. Inventories are being gradually accumulated and mills hope to have fair stocks before the middle of the year. Ship-breaking plants are increasing their output, but there is complaint of delay in the acceptance of bids for the sale of surplus ships. Bids submitted in December are reported still pending in Washington, D. C. Quicker action in this matter, breakers state, would help in relieving the curent scrap shortage. The forward half of the hull of the Russian tanker Donbass, which broke in two in a Pacific storm, has been towed to the Seattle plant of Puget Sound Bridge & Dredging Co., expected to yield 1500 tons of scrap.

Heavy melting steel remains $26, fob mill, although some dealers claim the market is closer to an average of $28. Heavy melting scrap was recently sold by the Navy to a Seattle dealer who bid $27.48 per ton for 240 tons, to which a $2 freight to Seattle must be added. A three months' contract for light scrap from the Navy shops went to a Seattle dealer on a bid of close to $24. Machine shop cuttings, three months' contract, were closed at $16.88.

The cast iron scrap market is firm at $40, supplies being easier but not sufficient to soften the situation. Eastern buvers are still active here, offering $45 to which $20 freight must be added. These outside buyers, together with an almost total lack of pig iron, have thrown additional pressure on cast iron scrap.

Iron Ore . . .

Iron Ore Prices, Page 140

Cleveland — Opening of the season's ore traffic through the Soo locks got underway last week. The first ore carrier through the locks, at 7 a. m. Monday, Apr. 5, was the *Charles M. Schwab,* followed by a long procession of other vessels. A year ago the first carrier passed upbound on Apr. 11.

With stocks of iron ore at lower lake ports and furnaces at a 30-year low, efforts are being made to surpass last year's total of 77,898,087 tons. With two or three exceptions, Pittsburgh Steamship Co.'s fleet of 62 vessels were in commission by last Thursday. Five of this largest inland fleet in the world are engaged in the limestone trade.

Shipments from upper lake ports totaled 62,792 tons for the week ended Apr. 5 compared with 24,863 tons for the like week a year ago, according to the Lake Superior Iron Ore Association, this city. All of these shipments were made from Escanaba.

Manganese Ore. . .

Ore Prices Page 140

New York — Manganese ore prices are increasing, with 48-50 per cent material now holding at around 67.60c to 72.60c, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., and New Orleans. The market recently has been holding at around 65.00 to 67.00c.

Current strength reflects increasing pressure from domestic consumers, whose stockpiles of about six months at the current rate of consumption are well below normal. Proposed defense program is naturally adding particular stimulus to demand at this time.

Rails, Cars . . .

Track Material Prices, Page 139

New York — Domestic freight car awards in March involve 13,427 cars, according to the American Railway Car Institute, of which 11,377 cars were awarded commercial shops and 2050 to railroad shops. This total compared with 10,698 for February.

Shop backlogs of 126,028 cars as of Apr. 1 are believed to be the highest since the early 20's.

March production of 9302 freight cars represents an increase of nearly 10 per cent over the preceding month. Of this number, 6940 cars were produced by commercial shops and 2362 by railroad shops. Production was more than three times the March, 1947, delivery of 2883 cars.

Recent buying is featured by the placing of 3000 seventy-ton, hopper cars by the Chesapeake & Ohio, American Car & Foundry Co. receiving 2000 for construction at its Huntington, W. Va., shops, and Bethlehem Steel Co., 1000 at its Johnstown, Pa., shops. The cost of the cars will be $12,250,000. The Soo Line has awarded 200 fifty-ton gondolas to its shops at North Fond du Lac, Wis., with work to begin in 1949.

Canada . . .

Toronto, Ont. — Production of primary iron and steel shapes in Canada totaled 290,840 net tons in January against 270,922 tons in December and 267,511 tons in January, 1947. January output included 279,884 tons of carbon steel shapes and 10956 tons of alloy steel shapes and included 77,283 tons of shapes shipped to producers' own plants or to other plants within the primary industry for further processing.

Primary iron and steel shapes shipped for sale in January amounted to 231,329 net tons, including 220,723 tons of carbon shapes and 10,606 tons for alloy steel shapes; for De-

cember, 178,273 tons of which 169,192 tons were carbon and 8361 tons alloy steel shapes; for January, 1947, 268,313 net tons of which 261,114 tons were carbon and 7199 tons alloy steel shapes. Shipments for sale do not include deliveries to consumers' own plants or other plants within the industry for further processing.

Shipments for sale during January included 6667 tons of semifinished shapes; 16,612 tons of structural; 14,059 tons of plates; 42,885 tons of rails; 51,466 tons of hot-rolled bars; 11,506 tons of pipes and tubes; 14,587 tons of wire rods; 23,909 tons of black sheets; 7828 tons of galvanized sheets; 8951 tons of castings and 32,859 tons of shapes.

Production Losses from Coal Mine Strike Mount

(*Continued from Page 54*)

considerable apprehension is felt lest some carriers be idled for lack of fuel, causing a serious and irreparable loss in iron ore shipments. Fleet operators are dickering for loans of coal from stockpiles of upper lake railroads and mining companies.

Further curtailment in passenger and freight rail service is being contemplated by the Office of Defense Transportation. Rail carriers have only a 20-day supply of coal.

Utility companies generally have fair stocks of coal yet, but a few are planning curtailments this week unless coal shipments are resumed. Brooklyn Union Gas Co. has informed President Truman and members of Congress that it may have to suspend gas service to its three million customers unless the mines are reopened by the end of the week.

Foundries Suffer — Shutdowns of coke ovens and blast furnaces are pinching foundry operations sharply. Already hard hit by the pig iron and coke shortage, the severe cutbacks of last weekend will add to their scarcities.

Blast furnaces were being banked in increasing numbers as the week closed. On Thursday, Carnegie-Illinois had banked ten stacks and taken off 38 open hearths in the Pittsburgh district. Republic Steel banked a blast furnace at Birmingham and was scheduled to bank a stack at Canton and three at Youngstown over the weekend. Bethlehem banked three at Buffalo and reduced wind on three others. Four Bethlehem stacks were idle at Johnstown. Hanna Furnace shut down a merchant stack and planned curtailment on others.

Wheeling Steel had two of its three blast furnaces idle. Pittsburgh Steel had banked one stack. Crucible Steel was to take off a stack Saturday. Inland Steel banked two stacks at Chicago. Newport Rolling Mill's blast

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furnace at Martin's Ferry is down. American Rolling Mill Co. planned to bank two over the week end.

U. S. Polishes Machinery For Material Buying

(*Continued from Page* 58)

city (prime and subcontract) for the production of designated products at a specified rate.

3. To acquaint industry with part of the task it will be expected to perform, and encourage its co-operation in planning for mobilization of industry.

4. To provide a current record of competent producers together with estimates of their capacities to meet prospective demands.

5. To determine what items of supply cannot be provided by conversion of private capacity and thus help to calculate requirements for new construction.

6. To eliminate competition between the procurement agencies of the armed services for the output of a single plant.

7. To minimize the need for construction of new facilities during a war by fostering thorough utilization of existing facilities.

8. To foster production cost estimation in advance by industry and expedite negotiation of contracts for desired materiel.

9. To have a system in being which readily can be adapted to clearance of important contracts by a central control agency.

Survey To Be Expanded — While 11,000 plants will be covered in the first survey by the armed services, the Munitions Board plans later to extend the survey to cover more than twice that many establishments. Of a total of 86,000 industrial establishments, 22,000 to 25,000 account for more than nine tenths of total output.

"Ultimately," says the Munitions Board, "the results of this effort will provide the U. S. Military Establishment with an accurate, comprehensive knowledge of its sources of supply in war, and the best possible planning basis for planning wartime military procurement in peacetime. It will provide individual manufacturers with a knowledge of their probable production role in the event of war—a knowledge which will enable them to prepare by having sufficient time in which to anticipate, study and overcome probable and potential production problems. . .

"It means a device which will enable us to achieve full war production in a period much shorter than has heretofore ever been realized—a time-saving device which could mean the difference between victory and defeat."

Uniform Procurement—Public Law 413, the "Armed Service Procurement Act of 1947," is aimed at setting up uniform procurement policies for the three services and reducing the opportunities for irregularities or earning of unduly large profits at the expense of the taxpayers.

The first objective—uniform procurement policies—is proving difficult. It means that each service will have to abandon some pet practices of its own that have been developed over the years and which have assumed an almost sacred status within the service.

The Munitions Board is expected to announce the new procurement regulations about July 1. These regulations are now being worked out by the board and the brass hats of the three services.

A basic requirement of the act is that "a fair proportion of the total purchases and contracts for supplies and services for the government shall be placed with small business." Another is that purchases must be made on the basis of advertising, excepting under circumstances specifically defined in the act. A third is that contracts may be let on a cost-plus-a-fixed-fee basis, but not on a cost-plus-a-percentage-of-the cost basis.

Many Exceptions — So many exceptions are provided to the requirement for advertising that it is difficult to prescribe uniform policies. Procurement may be by negotiation without advertising if:

1. Determined to be necessary in a period of national emergency declared by the President or Congress.

2. The public exigency will not admit of the delay incident to advertising.

3. The aggregate amount involved does not exceed $1000.

4. For personal or professional services.

5. For service to be rendered by any university, college or other educational institution.

6. The supplies or services are to be procured or used outside the United States and its possessions.

7. For medicines or medical supplies.

8. For supplies purchased for authorized resale.

9. For perishable subsistence supplies.

10. For supplies or services for which it is impracticable to secure competition.

11. For experimental, development or research work, or supplies for experimentation, development, research or test.

12. Disclosure to the public is not conducive to the national interest.

13. For promotion of standardization of equipment and interchangeability of parts when such standardization and interchangeability are necessary in the public interest.

14. For supplies whose manufacture entails a substantial initial investment or an extended period of preparation.

15. For goods which, after advertising, have brought out bid prices found to be unreasonable or not arrived at in free competition.

16. If "any plant, mine, or facility or any producer, manufacturer, or other supplier" must be made or kept available for furnishing supplies or services in the event of a national emergency.

17. Otherwise required by law.

Almost Defeats Purpose—Informed service officials, of course, point out that this list of exceptions is so broad as almost to defeat the purpose of Congress in enacting it. It gives the military authorities the widest possible latitude in writing regulations under which they will be applied.

The act provides that "in the case of a cost-plus-a-fixed-fee contract the fee shall not exceed 10 per centum of the estimated cost of the contract, exclusive of the fee. . . except that a fee not in excess of 15 per centum . . . is authorized in any contract for experimental, development, or research work and that a fee inclusive of the contractor's costs and not in excess of 6 per centum of the estimated cost, exclusive of fees, in contracts for architectural or engineering services relating to any public works or utility project."

Oil Field Equipment Steel Needs Pressing

(*Continued from Page* 65)

again by the National Petroleum Council and then by the Interior Department's Oil & Gas Division. After that, Commerce will want to screen it carefully before deciding then any steel allocations requests for petroleum are warranted. It may take as long as 60 days, he said, before a final conclusion can be reached.

Steel Report Unrealistic — Mr. Bruce said that the chief objection to the petroleum steel report is that it is unrealistic in calling for much larger tonnages of certain steel products than could be had from existing capacity. For instance, the tonnage of large-diameter line pipe which the report represents as a requirement is more than 25 per cent larger than can be had from existing capacity.

Rust-Oleum is a positive rust preventive. Prepared with scientifically-processed fish oil, it's available in a variety of colors for every industrial use.

Rust-Oleum can be applied directly over *rusting metal*—by brush, dip or spray. No sand-blasting or chemical "dissolvers" are necessary. Simply wire brush surface to remove dirt, scale, etc.

Rust-Oleum covers 30% more area per gallon . . . goes on 25% faster . . . *outlasts ordinary paints two to ten times.* This means lower maintenance cost on every job.

Ask your distributor . . . or write for catalog and full facts TODAY!

RUST-OLEUM CORPORATION
2471 Oakton Street, Evanston, Illinois

Improve Machining These FOUR Ways With Oakite Soluble Oil

1 BEST LUBRICATION: Ample lubrication of Oakite Soluble Oil acts as a protective cushion in all your machining operations. Highly refined, it forms stable emulsions.

2 SUPERIOR COOLING: Oakite Soluble Oil emulsions rapidly carry off heat. By reducing friction, emulsions of Oakite Soluble Oil keep work and dies cooler; minimize draw on the temper of the tool; lessen distortion of work.

3 CLEAN CUTTING: Giving the ultimate in cooling and lubrication, emulsions of Oakite Soluble Oil provide straight, sure cuts in cold sawing operations.

4 LONG SOLUTION LIFE: Emulsions of Oakite Soluble Oil stay workable longer because special ingredients help ward off solution rancidity. That means economical machining . . . less danger of dermatitis.

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Send today for your FREE copy of the Oakite Soluble Oil Booklet which tells how you can use this economical coolant in all your machining, grinding and related operations.

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MATERIALS • METHODS • SERVICE

A modification and clarification of the indicated requirements for containers, tank cars and tankers is needed before Commerce would feel warranted in requesting voluntary allocations.

Carborundum Begins New Wheatfield, N.Y., Facility

Carborundum Co., Niagara Falls, N. Y., has broken ground for Building No. 2 at its new Wheatfield, N. Y., plant which will house the company's Coated Products Division.

This building, containing 190,000 sq ft of floor area, connects two of four structures formerly occupied by Bell Aircraft Corp. and is planned for occupancy in September. Carborundum has also added a new boiler house to the plant. Among other facilities, Building No. 2 will house making machines, one of which will be about 57 ft wide and 400 ft long. When threaded, this machine will contain over 13 miles of paper or cloth used for backing in the manufacture of coated abrasives.

J & L Dissolves Three West Virginia Subsidiaries

Jones & Laughlin Steel Corp., Pittsburgh, has dissolved three of its subsidiaries and will take over their operations which involve production of raw materials in West Virginia.

The move, taken to simplify the parent firm's corporate structure, concerns Blair Limestone Co. which for the past 31 years has been quarrying limestone and dolomite in Jefferson and Berkely counties; Black Eagle Smokeless Coal Co., acquired in 1946, which operates a low-volatile coal mine near Mullens; and Darr Smokeless Coal Co., acquired last month, which operates a low-volatile coal mine at Twin Branch.

Ryerson Completes Plant In San Francisco Area

Joseph T. Ryerson & Son Inc., Chicago, steel distributor and subsidiary of Inland Steel Co., has completed construction of a steel service plant at Emeryville, Calif., in the San Francisco Bay area.

Wayne D. Dukette, formerly manager of the plant in Cincinnati, is manager of the new unit. Ray C. Page, formerly assistant sales manager of the company's plant in Chicago, is sales manager.

Facility will provide service on a line of steel products to include bars, structural shapes, plates, sheets, special steel consisting of alloy and stainless items, babbitt metal, nonmetallic bearings and allied products. Tools and machines for cutting and handling steel have been installed. Complete equipment for cutting, bending and forming concrete reinforcing bars is also included.

This is the thirteenth unit in the Ryerson group and marks the company's second entry into the West Coast industrial market, a new plant at Los Angeles having been placed in operation in October, 1946.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1100 tons, barker and chipper units, Zellerbach Paper Co. pulp plant, Camas, Wash.; to Isaacson Iron Works, Seattle.

785 tons, state bridge work, Trenton, N. J., to American Bridge Co., Pittsburgh.

780 tons, two bridges, Thayer, Wyo., for Union Pacific railroad, to American Bridge Co., Pittsburgh.

600 tons, power house, Central Iowa Power Corp., Cedar Rapids, Iowa, to Iowa Steel & Iron Works, Cedar Rapids, Iowa.

300 tons, log deck, Weyerhaeuser Timber Co.'s saw mill, Springfield, Oreg., to Gunderson Bros. Co., Portland, Oreg.

290 tons, 8-story office and show room building, 239 West 49th St., New York, to the Grand Iron Works Inc., that city.

287 tons, new building, Allstate Insurance Co., Chicago, to Bethlehem Steel Co.

262 tons, bridge, sec. FX-F Cumberland county, Illinois, for State Highway Department, to American Bridge Co., Pittsburgh.

248 tons, bridge, proj. W2F1, Fayette county, Illinois, for State Highway Department, to American Bridge Co., Pittsburgh.

235 tons, state bridge, Snyder county, Pennsylvania, to Fort Pitt Bridge Works, Pittsburgh.

215 tons, four state bridges, Gloucester, Mass., to Bethlehem Steel Co.

150 tons, bridge, WER-2, Douglas county, Wisconsin, for state, to American Bridge Co., Pittsburgh.

137 tons, bridge, proj. ERS-8(1), Scranton, Iowa, for state, to Pittsburgh Des Moines Steel Co., Pittsburgh.

135 tons, Bethany Presbyterian church, Nanoa, Philadelphia, to Lehigh Structural Steel Co., Allentown, Pa.

130 tons, 6-story apartment house and garage, 110th St. and 72nd Road, Forest Hills, Long Island, to Grand Iron Works Inc., New York.

Unstated, 20 railroad cabooses for Alaska Railroad; contract to Pacific Car & Foundry Co., Seattle.

Unstated, 428-foot steel broadcasting tower for KOMO station, Seattle, to International Derrick & Construction Co., Los Angeles.

STRUCTURAL STEEL PENDING

13,000 tons, express-way, East Boston, Mass.; steel to be let in two contracts, 8000 tons and 5000 tons.

1094 tons, state bridge work, Vine St., Philadelphia, bids Apr. 30; in addition are 2130 linear feet of steel beam or steel casing piles.

1000 tons or more, galvanized steel and specials for transmission towers; bids to Bonneville Power Administration late April.

925 tons, state bridge, Delaware county, Pennsylvania, bids Apr. 23.

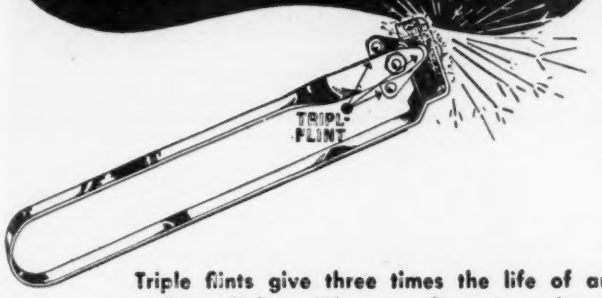
500 tons, hydroelectric plant, Sault Ste. Marie, Mich.; bids to U. S. Engineer, Detroit, Apr. 21.

125 tons, state bridge, Kingston, Mass.; bids in.

120 tons, state bridge and railroad underpass, Ware, Mass.; bids in.

100 tons, bids to Bonneville Power Adminis-

the Meco TRIPL-FLINT LIGHTER COSTS LESS because IT LASTS so much LONGER



Triple flints give three times the life of an ordinary lighter. When one flint wears down, another is quickly and easily rotated into place. In addition every flint wears right down to the metal base instead of breaking off. The big round file not only assures a fat, hot spark every time, but because it can be rotated for wear on all sizes, it outwears a flat file at least four to one — is self cleansing. Handle construction is sturdy, rigid and rust protected. Both file and flints easily and inexpensively replaced. Inquire today!

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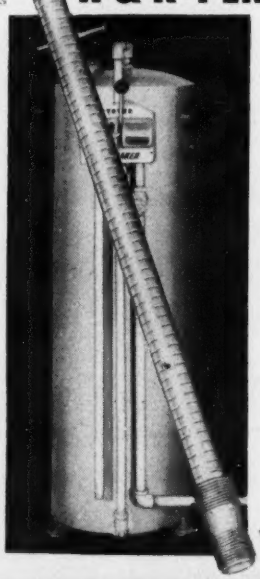
CASE HISTORY:

STOVER WATER SOFTENER CO.

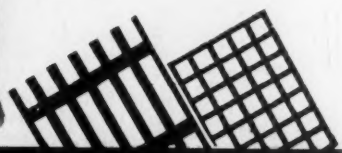
H & K PERFORATED METALS



In water softener tanks, too—such as the fine products of the Stover Water Softener Company, St. Charles, Illinois—**H & K Perforated Metals** play a very prominent role . . . being used as inlet and outlet water distributor tubes.

Whether you need Perforated Metals such as Stainless Steel or Monel, or diverse materials like plywood, plastics, rubber and fabrikoids, consult H & K. Backed by 65 years precision perforating of materials for use in screens, grilles, filters, ventilators, etc., H & K gives you a wide range of sizes, shapes and spacings.

Don't forget—H & K "Make Your Own" Safety Guards . . . strong, safe, inexpensive. Ask about them!



The Harrington & King PERFORATING Co.

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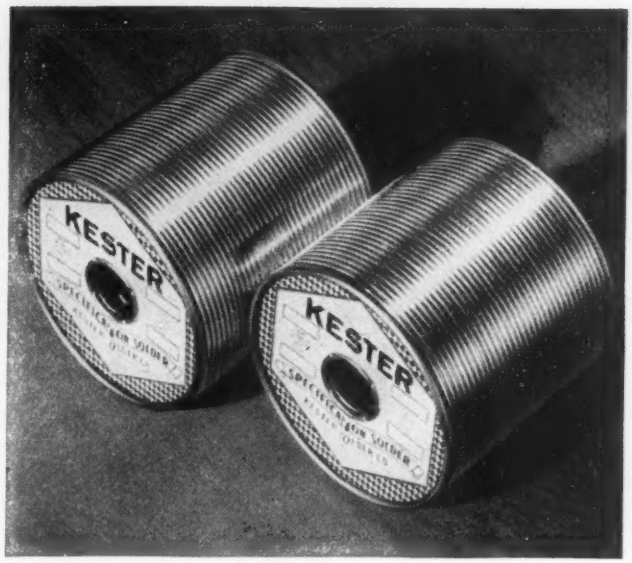

Uniform in Looks but ONE is best for You!

All solders look alike but many will vary widely in performance. Standardize on Kester Cored Solders, with their pure, uniform and dependable flux core and be sure of outstanding work.

Consult our engineers, without obligation, on any soldering problem. One of our Cored solders can be fitted to your needs.

KESTER SOLDER COMPANY

4222 Wrightwood Avenue, Chicago 39, Illinois

Factories Also At Newark, New Jersey — Brantford, Canada

tration, Portland, Oreg., Apr. 29.

Unstated, shapes for Cedar river powerhouse shops; bids to Seattle April 9.

REINFORCING BARS . . .

REINFORCING BARS PLACED

700 tons, library building, Washington State College, Pullman, to Bethlehem Pacific Coast Steel Co., Seattle; Henry George & Sons, Spokane, general contractor.

400 tons, grain elevators at Bluestem and Downs, Washington, to Northwest Steel Rolling Mills, Seattle.

300 tons, Unit H, medical-dental building, University of Washington, to Northwest Steel Rolling Mills, Seattle.

100 tons, St. Gertrude's convent, Cottonwood, Idaho, to Northwest Steel Rolling Mills, Seattle.

REINFORCING BARS PENDING

5500 tons, siphon and canals, Columbia Basin project; bids to Bureau of Reclamation, Denver, within 90 days.

3555 tons, concrete dam and powerhouse substructure, Buggs Island project, Mecklenburg county, Virginia; bids Apr. 20, U. S. Engineer, Fort Norfolk, Va.

1000 tons, hydroelectric plant, Sault Ste. Marie, Mich.; bids to U. S. Engineer, Detroit, Apr. 21.

800 tons, auxiliary outlet sewers, Paulina St. system, cont. No. 1, Department of Purchases, Chicago; bids Apr. 20.

500 tons, Irving Park telephone exchange, Illinois Bell Telephone Co., Chicago; bids Apr. 16.

350 tons, research and development laboratory, Portland Cement Association, Skokie, Ill.; bids Apr. 25.

105 tons, state highway work, Lancaster county, Pennsylvania, bids Apr. 23.

100 tons, Southwest Side Intercepting sewer, cont. 12-A, for Sanitary District of Chicago; bids Apr. 15.

Unstated, sports stadium, Fort Lewis, Wash.; J. G. Watts Construction Co., Seattle, low, $272,223.

Unstated, pier and terminal expansion, Port of Olympia, Wash.; $300,000 project; bids in.

Unstated, additions to buildings 3 and 4, State Hospital, Ana, Ill.; bids Apr. 15.

PLATES . . .

PLATES PENDING

9000 tons (tie plates) for Alaska Railroad; Bethlehem Pacific Coast Steel Corp., Seattle, low; bids also in for track bolts and spikes.

Unstated tonnage, five 22-foot diameter welded plate penstocks, Davis Dam project, Bureau of Reclamation; Southwest Welding & Mfg. Co., Alhambra, Calif., low, $935,000.

PIPE . . .

STEEL PIPE PENDING

Unstated, 5875 feet 8 inch, valves and gates, or alternatives; bids to W. Fred Lee, Secretary water district, Mukilteo, Wash., Apr. 13.

RAILS, CARS . . .

RAILROAD CARS PLACED

Chesapeake & Ohio, 3000 seventy-ton hoppers with 2000 going to the Huntington, W. Va., shops of American Car & Foundry Co., and 1000 to the Johnstown, Pa., shops of Bethlehem Steel Co.

Soo Line, 200 fifty-ton all-steel gondolas to its North Fond du Lac, Wis., shops.

LOCOMOTIVES PLACED

United Fruit Co., through Maritrop Trading Corp., 12 steam locomotives, for use in Guatemala, to Baldwin Locomotive Works, Eddystone, Pa.

CONSTRUCTION AND ENTERPRISE

CALIFORNIA

VERNON, CALIF.—Vernon Kilns, 2310 E. Second St., has awarded a $340,000 contract to Austin Co., 777 E. Washington St., Los Angeles, for construction of a factory, warehouse and office.

ILLINOIS

DECATUR, ILL.—Archer-Daniels-Midland Co. has awarded a contract to Chemical Plant Division, Blaw-Knox Co., for construction of a soybean extraction plant. Included in the contract will be installation of special equipment developed by Blaw-Knox.

FAIRMONT CITY, ILL.—Illinois Farm Supply Co., c/o Illinois Agriculture Association, 608 S. Dearborn St., Chicago, has awarded a $1,150,000 contract to James Stewart Corp., 231 LaSalle St., Chicago, for construction of a phosphate fertilizer plant.

INDIANA

KOKOMO, IND.—Continental Steel Corp., S. Main St., plans plant extensions and installation of new equipment, at a cost of $1,500,000.

TERRE HAUTE, IND.—Commercial Solvents Co., 1331 S. First St., has awarded a $118,000 contract to Glenn North Construction Co., Ninth and Tippecanoe Sts., for construction of a plant.

MISSOURI

JOPLIN, MO.—Empire District Electric Co., James E. Harsh, president, 602 Joplin St., plans a $4,375,000 project to include a 30,000 kw steam generating plant, building to house it, auxiliaries and other equipment.

LOUISIANA, MO.—Department of the Interior has awarded $4,413,250 contract to Koppers Co. Inc., Pittsburgh, for the design and construction of a gas synthesis demonstration plant near here.

ST. LOUIS — Bailey Auto Body Co., 2000 Chouteau Ave., has awarded a $110,000 contract to Wm. H. & Nelson Cunliff Co., 3320 Lindell Blvd., for construction of a 1-story plant at 720 S. Boyle Ave.

NEW JERSEY

CAMDEN, N. J.—Public Service Electric & Gas Co., Front and Chestnut Sts., has awarded a $2,600,000 contract to Koppers Co. Inc., Koppers Bldg., Pittsburgh, for construction of a liquid purification plant and 37 coke ovens.

ELIZABETH, N. J.—International Corp., 350 Fifth Ave., New York, has awarded a $2 million contract to Frank Briscoe Co. Inc., 287 S. 19th St., Newark, for construction of an ink plant at Division and York Sts.

NEW YORK

BUFFALO—Westinghouse Electric Corp., Ellicott Sq., has awarded a $250,000 contract to John W. Cooper Co. Inc., Sidway Bldg., for construction of a warehouse.

CHEEKTOWAGA, N. Y.—Summer & Co. Inc. plans a $150,000 expansion program at its railway equipment plant here. The company contemplates a new production line for the rehabilitation of railway cars.

DUNKIRK, N. Y.—Buffalo Niagara Electric Corp., Electric Bldg., Buffalo, will build a steam electric plant here to cost approximately $17 million.

MT. VERNON, N. Y.—Wolta Electrical Products Corp., 440 Lafayette St., New York, has awarded a $200,000 contract to A. Barbaresi & Son Inc., 10 Fiske Pla., for construction of a 2-story plant at S. Terrace Ave. and S. MacQuesten Pkwy.

OHIO

CLEVELAND—Elliott Electric Co., 2178 W. 25th St., will spend $100,000 on repairs to a plant damaged by fire several months ago. An additional storage facility is also planned.

CLEVELAND—Baker-Raulang Co., 8200 Baker Ave., has awarded a $100,000 contract to H. G. Slatmyer & Son Construction Co., 208 Lakeside Ave., for erection of a 1-story automobile body factory addition.

CLEVELAND — Accurate Die Casting Co., 2089 E. 80th St., estimates floods caused $500,000 damages to its machinery and $50,000 damages to its machined dies during a recent storm.

EAST SPRINGFIELD, O.—Warners Colliers Co. plans to spend $2,500,000 to develop a new coal mine near here.

MT. VERNON, O.—Roach Industries reports that its sheet metal foundry building was damaged severely during a recent storm.

MT. VERNON, O.—Cooper-Bessemer Corp. has received a $3 million order for 70 diesel engines to be used in 35 American-built twin-diesel locomotives for the Argentine State Railways. Locomotives are being built by General Electric Co.

PENNSYLVANIA

ALLENTOWN, PA.—Charis Corp., 7301 Linden St., c/o Lovelace & Spillman, architects, 103 W. Broad St., Bethlehem, will spend $175,000 on a building addition.

DOWNINGTOWN, PA. — Downingtown Paper Co., 301 Brandywine Ave., has awarded a $70,000 contract to Robert E. Lamb & Son Inc., 843 N. 19th St., Philadelphia, for construction of a boiler house.

GREENVILLE, PA.—Chicago Bridge & Iron Co. will build a $70,000 office addition on Waugh Rd.

LANCASTER, PA.—Radio Corp. of America, 415 S. Fifth St., Harrison, N. J., will build a $400,000 plant.

MCKEES ROCKS, PA.—Pittsburgh & Lake Erie Railroad, F. R. Paisley, chief engineer, Terminal Bldg., Pittsburgh, has awarded an $80,000 contract to D. W. Smith Inc., 11 Banksville Rd., Pittsburgh, for construction of a car repair shop addition.

PHILADELPHIA—Chase Brass & Copper Co., 46 N. Sixth St., has abandoned a project to build a $68,000 warehouse.

PHILADELPHIA—Quaker Rubber Co., Comly and Milnor Sts., has awarded separate contracts totaling $70,000 for construction of a plant addition.

PHILADELPHIA—Delany & Co., Milnor and Cottman Sts., has awarded a $200,000 contract to John P. Hallahan Co., Finance Bldg., for construction of a factory.

TEXAS

CARTHAGE, TEX.—United Gas Pipe Line Co., United Gas Bldg., Houston, plans to build a $3,500,000 gasoline plant.

DALLAS, TEX. — Minneapolis-Moline Plow Co., 6500 Denton Dr., contemplates a $200,000 program to include purchase of additional machinery and equipment and a plant expansion.

DALLAS, TEX.—Western Electric Co., C. K. Lawson, manager, has awarded a $551,000 contract to Austin Co., M & M Bldg., Houston, for a 3-story warehouse and office at 5331 Mockingbird Lane. Project also includes alterations and additions to a garage.

DALLAS, TEX.—Daniel Auto Radiator Mfg. Co., c/o Wyatt C. Hedrick, architect, 904 Fort Worth Ave., has awarded a $148,000 contract to J. E. Morgan & Sons, 1414 Elm St., for construction of an industrial building.

HOUSTON, TEX.—Kagan & Rudy, 821 Commerce St., plans to erect a $175,000 building here.

HOUSTON, TEX.—Gulf Port Cement Co., Penn City Rd., will spend $1 million to enlarge its plant on the ship channel to manufacture cement from oyster shell.

HOUSTON, TEX.—Consolidated Steel Corp. has purchased two tracts of land totaling 80 acres along the Houston ship channel for $125,000. Land may be a possible site for a future plant.

SAN ANTONIO, TEX.—Transit Co., Transit Tower Bldg., will build a $150,000 shop.